

Model FR-20/30 Centrifugal Feeder

FR-20 and FR-30 ANSI/Metric Installation & Maintenance Manual

Refer all servicing to qualified personnel.

This manual is intended for use by qualified mechanics and electricians who install or service the Hoppmann FR-20 and FR-30 Centrifugal Feeders.

This manual is for feeders manufactured after January 1, 1995. Please verify the date of your feeder.



Record your serial plate information here for future reference



Model Number

Serial Number/Date

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Quick Start

About this Manual

Assumptions

This manual is written for qualified mechanics and electricians who install or service the Hoppmann FR-20 and FR-30 Centrifugal Feeders. All procedures in this manual should be performed by qualified personnel.

- ☞ References in this manual may not apply to your specific centrifugal feeder. In some cases, your direct supplier may have modified or replaced some of the standard components of the feeder on which these procedures are based. In such cases, you may need to slightly modify these procedures. If you are unsure which standard components of your FR-20 or FR-30 feeder (if any) have been changed, consult your direct supplier's documentation.

Models Covered

This manual covers all FR-20 and FR-30 models in ANSI or Metric, stainless steel, single or dual drive. If you are unsure which model you have, locate the inventory number on the serial plate of the feeder. If your feeder was manufactured prior to 1995, and has a serial number lower than 19448, please contact Shibuya Hoppmann for further information.

Caution Symbols & Messages

Caution symbols and messages in this manual call attention to hazardous voltages, moving parts and other hazardous conditions. Please understand what the different warning labels and indicators refer to and how to avoid possible injury and/or damage to personnel and equipment.



The exclamation point caution symbol denotes possible personal injury and/or damage to the equipment.



The lightning bolt caution symbol denotes possible personal injury and/or damage to the equipment from electrical hazards.

Equipment Improvements & Document Revisions Notice

Shibuya Hoppmann Corporation continually improves its products, and reserves the right to change or discontinue specifications and designs shown in this manual without notice and without incurring obligation. Shibuya Hoppmann Corporation has made every effort to verify the information contained in this manual, but reserves the right to correct any error at the time of the manual's next revision. 05.2017.

Acknowledgments

Grateful acknowledgment is made to HCCI for permission to reproduce the chain tensioning graphic. Plug-In Horsepower Resistor® is a registered trademark of KB Electronics Inc. for its electronic motor control circuit apparatus.

What to Do First

As-Built Documentation This manual does not contain as-built documentation. As-built documentation is provided by your direct supplier. If you purchased your tooled feeder directly from Shibuya Hoppmann, you will automatically receive this information in your System Operations Manual.

Tools You Will Need The FR-20 and FR-30 feeders are offered in both ANSI and metric versions. For maximum compatibility, ANSI units are classified as "soft ANSI" construction, meaning that metric threads and hardware are used throughout. Both metric and ANSI units require metric tools for repair or adjustment. If your direct supplier tooled your feeder with (SAE) hardware, you will need standard tools as well.



If the feeder has been tooled by your direct supplier, any part of the feeder that touches your product has been tooled for your product. Avoid making any adjustments to the tooling; moving the tooling may void your warranty and could adversely affect the performance of your tooled feeder.

Terms and Definitions

<u>Term</u>	<u>Equivalent Term, Definition or Abbreviation</u>
Feeder	Centrifugal Feeder, Sorter, Bowl, Unscrambler, Orienter, Rotary
"FR"	Feeder Ramp (Air Ramp, Flat Ramp)
Tooling	Mechanical and optical devices used to help orient products in the feeder bowl. May include: sensors, height qualifiers, wipers, air jets, etc.

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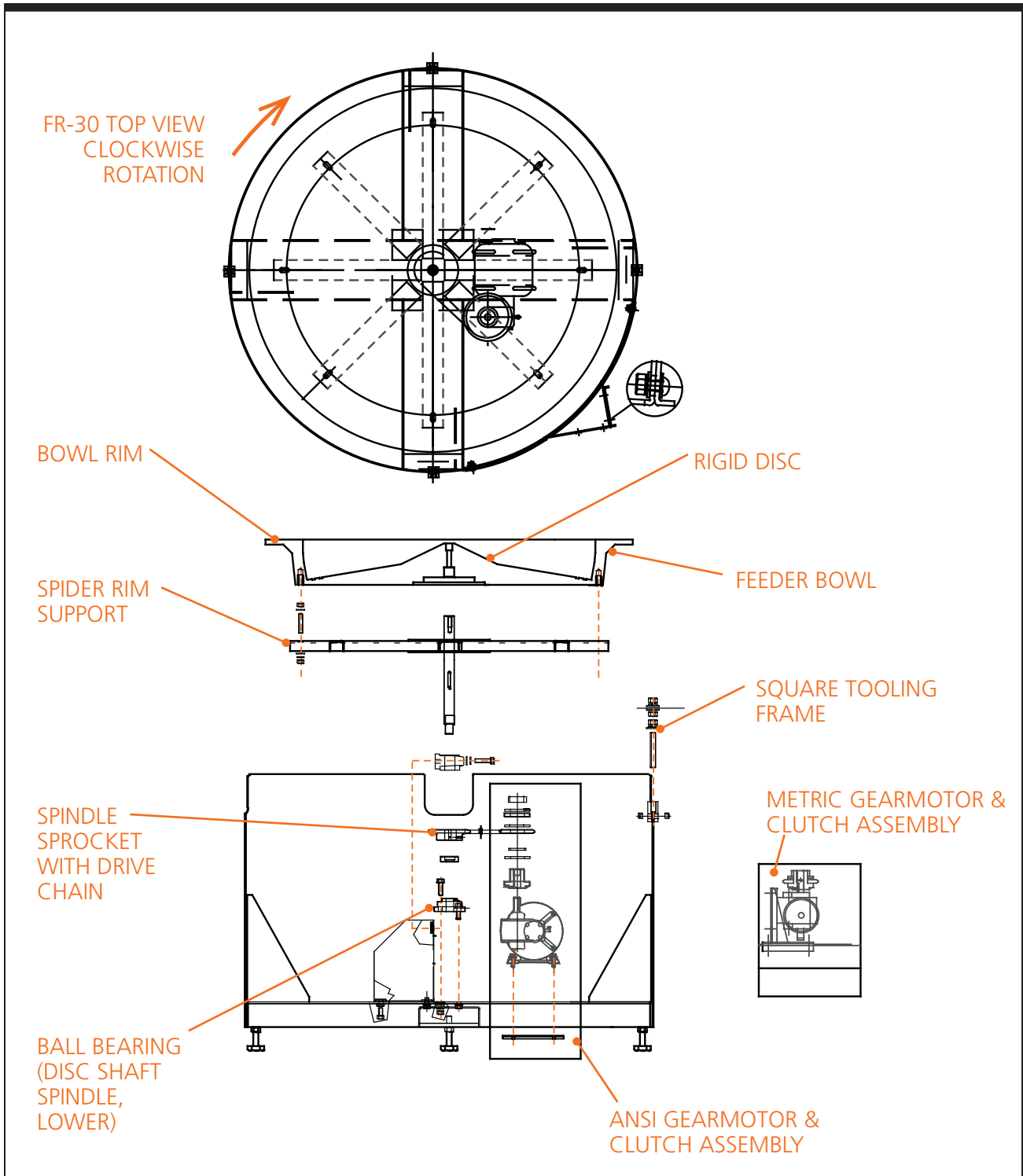


Figure 1-1. FR-20 and FR-30 Centrifugal Feeder - Exploded View

Feeder Description & Specifications

1

Overview of the FR-20 & FR-30

FR-20 vs. FR-30 The FR-20 & FR-30 Centrifugal Feeders unscramble, feed and orient product. Simply put, it delivers aligned product. Except for obtainable rates and the size of product, the FR-20 and FR-30 function identically. Generally, the FR-30 is used to handle larger product or achieve higher output rates.

Operation **Step 1—The Feeder Accepts Your Product.** Every FR-20 and FR-30 operates in the same basic way. The feeder accepts product from a separate bulk supply hopper or prefeeder. Product drops randomly into the bowl, a few at a time. (Shibuya Hoppmann centrifugal feeders function best when product is carefully metered from bulk by a prefeeder.)

Step 2—The Feeder Loads and Qualifies Your Product. After dropping into the bowl, product in the desired orientation is pushed up the stationary ramp. This process may be assisted in some applications by compressed air. After the product has been pushed up the ramp, it is loaded onto the moving rim of the bowl. The rim moves the product past mechanical, pneumatic and/or optical qualifiers which reject product that are not in the desired orientation. Improperly oriented product are recirculated.

Step 3—The Feeder Delivers Your Product. Finally, product moves off the bowl's rim and out of the feeder in the proper orientation, in a rapidly moving and in a randomly spaced stream. Shibuya Hoppmann centrifugal feeders deliver product almost immediately, so parts simply don't have time to get scuffed up.

Rate Shibuya Hoppmann feeders typically handle product at rates between 20 and 2000 parts per minute. Your particular product's characteristics and your desired production speed will affect the output rate.

Specifications of the FR-20

Standard Features The FR-20 is standard with stainless steel exterior construction and a Teflon® hard-coated anodized aluminium bowl with ABS plastic center cone.

Optional Features The FR-20 feeder can be easily integrated with polycarbonate covers (safety covers), washdown motor(s), air ramp and a variety of controllers and operating systems.

Specifications Please refer to the tables below for FR-20 specifications:

Required Accessories	Clockwise	Counterclockwise
Air Ramp	ARCWFR20SU	ARCCFR20SU
Square Frame Backup Ring	BUCWFR20SU	BUCCFR20SU
Electrical Specifications	DC	AC
Motor Size	1/5hp	1/4hp
Motor Frame Size	56C	56C
Supply Voltage	90 Volts	230/460
Motor RPM	1800	1725
Power Usage	3 Amps	3 Amps

Table 1-1. FR-20 Accessories and Electrical Specifications

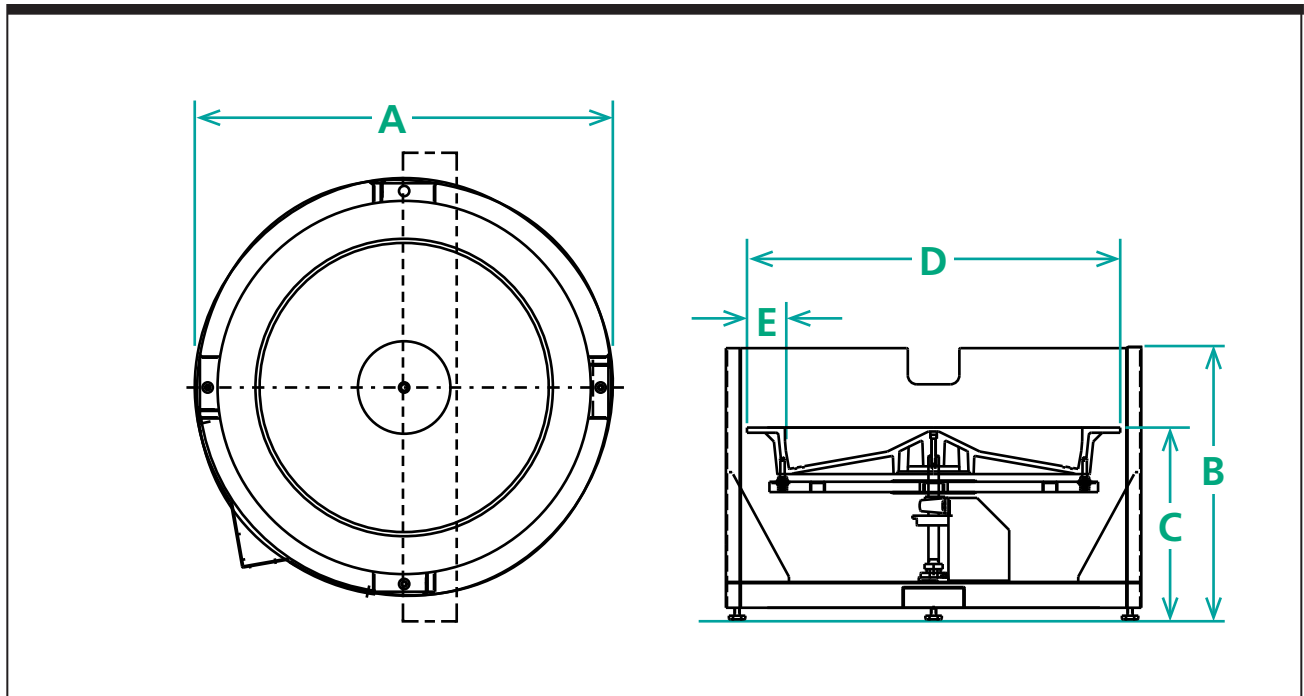


Figure 1-2. FR-20 Side and Top Views

Dimension Specifications		ANSI	Metric
A	Outer Wall Diameter	27.25 "	692.2mm
B	Overall Height	24.25 " ± 1 "	615.0 ± 25mm
C	Bowl Discharge Height	17.50 "	444.5mm
D	Bowl Outside Diameter	25.75 "	654.0mm
E	Rim Width	2.75 "	70mm
Overall Weight (Untooled)		≈ 210 lbs.	≈ 95 kg

Table 1-2. FR-20 Dimension Specifications

Specifications of the FR-30

Standard Features The FR-30 is standard with stainless steel exterior construction and a Teflon® hard-coated anodized aluminium bowl.

Optional Features The FR-30 feeder can be easily integrated with polycarbonate covers (safety covers), washdown motor(s), air ramp and a variety of controllers and operating systems.

Specifications Please refer to the tables below for FR-30 specifications:

Required Accessories	Clockwise	Counterclockwise
Air Ramp	ARCWFR30SU	ARCCFR30SU
Square Frame Backup Ring	BUCWFR30SU	BUCCFR30SU
Electrical Specifications	DC	AC
Motor Size	1/5hp	1/4hp
Motor Frame Size	56C	56C
Supply Voltage	90 Volts	230/460
Motor RPM	1800	1725
Power Usage	3 Amps	3 Amps

Table 1-3. FR-30 Accessories and Electrical Specifications

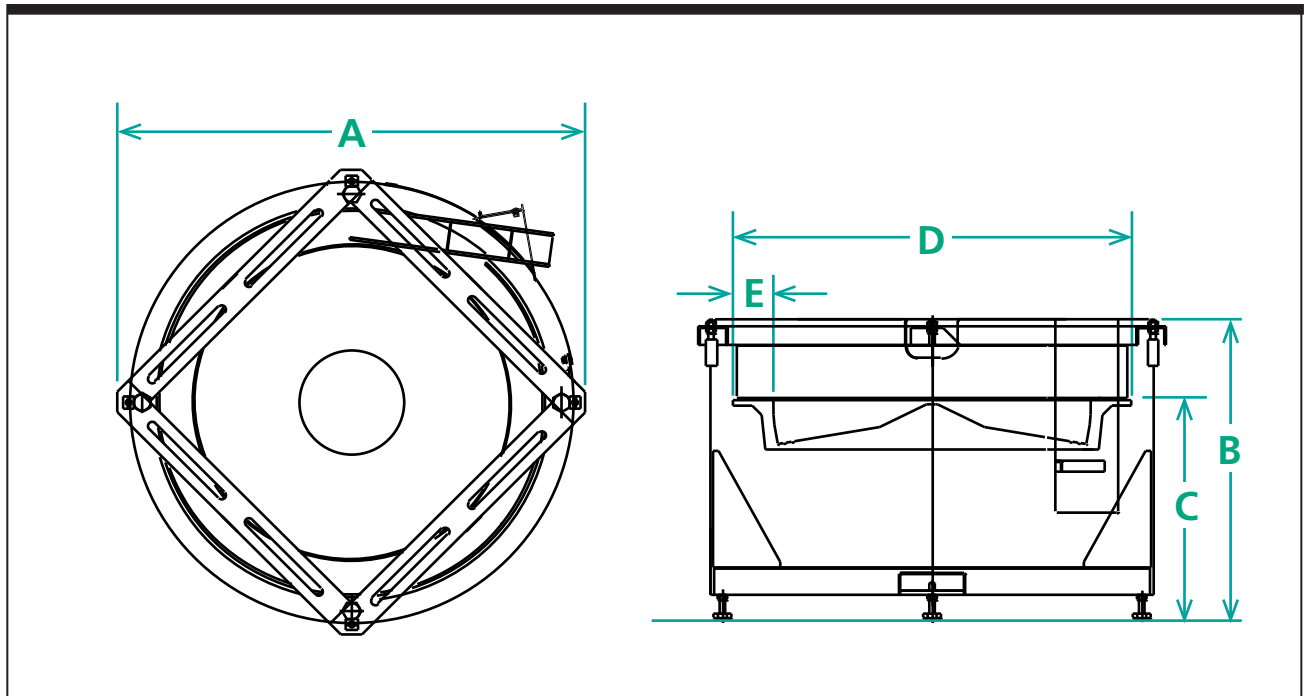


Figure 1-3. FR-30 Side and Top Views

Dimension Specifications		ANSI	Metric
A	Outer Wall Diameter	40.50"	1028.7mm
B	Overall Height	25.25" ± 1"	641.4 ± 25mm
C	Bowl Discharge Height	18.50"	469.9mm
D	Bowl Outside Diameter	36.13"	917.7mm
E	Rim Width	3.66"	93.0mm
F	Bowl Depth	4.25"	108.0mm
Overall Weight (Untooled)		≈ 350 lbs.	≈ 159 kg

Table 1-4. FR-30 Dimension Specifications

Notes

Safety Precautions

1

Safety Precautions

Hoppmann Feeders are designed to be as safe as possible for operators. However, even well-built machines can be installed or operated in a hazardous manner. Safety precautions must be observed by users.



Turn Off Power and Air. Before performing maintenance on the machine, ensure that power and air cannot be accidentally turned back on. Padlock and clearly tag the main electrical and pneumatic disconnect(s) before adjusting or replacing changeover parts or performing maintenance. Lockout/tag-out procedures are covered in United States Code of Federal Regulation (CFR) Title 29 Part 1910.147, "The Control of Hazardous Energy."



Dress Appropriately! Reduce the risk of injury from moving parts by securing loose sleeves and other clothing. Do not wear loose jewelry or neckties near the feeder. Wear safety glasses or other protective eye wear when servicing the feeder.



Install Safety Guards! Make sure the feeder remains safe to operate. Be sure all safety guards have been installed before returning the feeder to normal operation. Safety guards on the Centrifugal Feeder include any guards (which protect the operator from the moving bowl spider, sprockets and chains). Before feeder operation, secure all safety covers. Most safety covers are electrically interlocked, and will prevent the machine operation if disengaged.



Avoid Moving Parts. Never place anything in the machine except the handled part(s) for which it was designed. Never put your hands, tools, or other objects into the machine.

Operating & Maintenance: Do's & Don'ts

Don't Give the Feeder Too Much Product. Do not overfill the feeder, because it may jam or lose rate. Bulk product should be metered into the feeder. Allow only enough product into the feeder to keep the line running at the required rate.

Don't Run the Feeder Too Fast. Do not run the bowl faster than the linear feet per minute recommended by your direct supplier. If you do, the orientation qualifiers can not do their job as efficiently, and the feeder may jam or lose rate.

Don't Adjust Air Jet Flow Controls. It is okay to adjust the main air regulator to its correct setting for your installation. However, air jets and their individual flow controls have all been carefully preset to work with your product; they should never need adjustment. If you move air jets or adjust their individual flow controls, the feeder may jam or lose rate.

Do Perform Preventive Maintenance. To keep the feeder running without unexpected repairs and resulting downtime, regularly perform the preventive maintenance procedures in Chapter 4.

Do Carefully Replace Any Tooling You Remove. To gain access for repairs, you may need to remove tooling. Because Shibuya Hoppmann and your dealer or OEM have no control over such activities, they can not be responsible for any tooling you remove.



Carefully document the position of any tooling before you begin. If you fail to replace all tooling exactly as it was, you may create difficult and time consuming problems.

Don't Operate the Feeder Near Flammable Gas, Vapor or Dust. Do not install a feeder in these conditions unless you install additional, approved explosion-proof or dust ignition-proof enclosures. Without such additional enclosures, normal sparking of the brushes inside the motor could ignite flammable gas, vapor or dust.

Installation & Start-Up

3

Included in this Chapter

Follow, in order, each section of this chapter to install any fully tooled FR-20 or FR-30 feeder. For your convenience, Tables 1-1 and 1-2 show electrical specifications for your feeder and suggested wiring.

Unpacking, Inspection and Registration

Step 1— Inspect and Unpack the Crate. Remove packing materials from sensors, tooling and moving parts. Make a visual check to be sure parts have not come loose during shipping. If you find any concealed damage, call the shipping carrier and your direct supplier immediately. **Do not attempt to fix the problem yourself unless told to do so by your direct supplier.**



Step 2—Record Serial Numbers. For future reference and assistance in ordering parts, record on the front of this manual the feeder's model and serial number.

Physical Setup

You should refer to as-built drawings (not part of this manual) for electrical, pneumatic and equipment layout specifications.

Step 1—Position the Feeder. Place the feeder as shown on the equipment layout drawing provided by your direct supplier.

Step 2—Level the Feeder. Level the machine by adjusting the leveling feet. Tighten the locknuts on the leveling feet. Note: In some applications leveling feet are not used because the feeder is connected directly to other framework.

Step 3—Connect the Output Device. Check that product can move smoothly from the exit of the feeder to your output device (deadplate, conveyor, gravity track or powered rollers, for example). Check that product will not jam or lose their orientation as they move to the output device.

Step 4—Position the Prefeeder. Now place your bulk supply hopper, or prefeeder, into position. Follow the equipment layout drawing provided by your direct supplier, or the feeder may not operate correctly. **If you are providing and integrating a prefeeder, continue reading the step below. If your direct supplier is providing and integrating both your feeder and prefeeder, skip to Step 5.**

If you are supplying your own prefeeder, you are responsible for:

- Providing and installing the feeder's bowl level switch so it can control the flow of your prefeeder.
- Setting the timing delay for the feeder's bowl level switch.
- Correctly positioning the prefeeder. Generally, the prefeeder should discharge product to fall on the rigid disc, halfway between the center of the bowl and the outside diameter. Take a handful of product and drop them from the chute of your prefeeder into the feeder. Avoid dropping product so that it bounces up off the rigid disc onto the rim of the bowl, which could knock off product that are already loaded. You may need to position the prefeeder again once the feeder is running.

Step 5—Connect Electrical Supply and Air. Connect your feeder to electrical supply and compressed air (if applicable). Do not change the main air regulator – it should be correctly set when you receive the feeder.

Starting the Feeder for the First Time

Step 1—Secure Safety Covers. Before turning on power and air, make sure safety covers are in place and that you are dressed appropriately for safety.

Step 2—Check for Rubbing Parts. Turn the feeder bowl by hand. In the unlikely event that you hear any unusual noises, discontinue immediately and check in and around the bowl for any foreign objects causing the noise (for example, check between the backup ring and the rim of the bowl.)

Step 3—Turn on Power and Air. Turn on the feeder's power. If applicable, turn on the feeder's main air regulator.

How to Set Proper Bowl Speed

Ask your direct supplier for the actual speed at which the bowl should rotate. For reliability, set the bowl to match that speed.

- ➔ You will need a hand-held tachometer (analog or digital) with a surface speed wheel indicator (see Figure 3-1).
- ➔ This procedure is performed with power on and the feeder operating. If your direct supplier has installed a cover over the bowl, you will need to open it before proceeding.

Step 1—Turn on Feeder. Turn on the feeder and run it without product.

Step 2—Set Bowl Speed. To set bowl speed, place hand-held tachometer (with surface speed indicator attachment) on the inner wall of the moving bowl, at its most upper inside diameter. Adjust bowl speed until bowl is moving at correct number of linear feet per minute (FPM).

Step 3—Record New Settings. Turn off the feeder. Mark dial plate with new setting and remove any old marks.

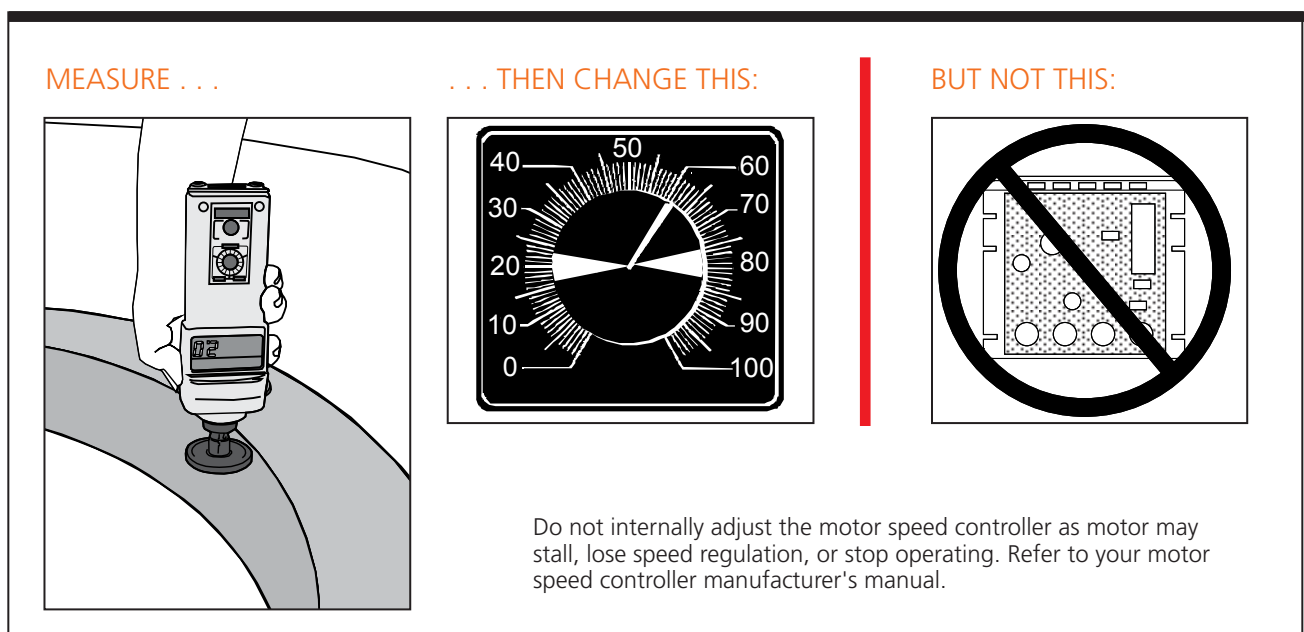


Figure 3-1. Measurement and Changes to Bowl Speed

Running Product for the First Time

Step 1—Verify Changeover Setup. If your feeder is tooled to run multiple parts, ensure the feeder is set up for the product you want to run.

Step 2—Inspect Product at Exit. Inspect the exit of the feeder. If product is exiting the feeder properly oriented, at the required rate and without jamming, then installation is complete. Otherwise, continue with Step 3. Do not adjust the flow controls on air jets.

Step 3—Verify Prefeeder Speed. Normally this step is completed by your direct supplier. However, if you are separately providing and integrating the prefeeder, you will have to set the prefeeder's speed. To do this, turn the prefeeder's speed control all the way down, then turn on the feeder.



- ➡ Slowly (you may need to take several minutes) raise the prefeeder's speed control until enough parts exit the feeder to keep the line running at the required rate. **Excessive output may overload the feeder and reduce its output.**

General Tips

- ➡ After your feeder is set up and running, observe the flow of product at each transition point. Later, if a problem occurs, observe these transition points to help pinpoint the cause.
- ➡ Listen to the way the feeder sounds when it is running properly. If it suddenly sounds different, investigate why.

Preventive Maintenance

4

General Cleaning

Outer Frame & Tooling

The Shibuya Hoppmann Model FR-20 and FR-30 Centrifugal Feeders are not intended for wash down use. If you need to clean the outer frame, the rim of the bowl, the rigid disc or tooling, use mild, non-abrasive household cleaners. Cycle the machine as necessary so that all areas are cleaned. Next, use a clean cloth dampened only with water. Immediately wipe any damp surface with a dry cloth.

Clean Safety Covers

If your feeder has any attached polycarbonate safety covers, we suggest using a clean cloth, lightly dampened, to clean the material. While polycarbonate is extremely strong, it scratches easily, and can be fogged even by mild non-abrasive cleansers.

Tip

To minimize scratches on polycarbonate safety covers, use a mild automobile polish and/or a microfiber cloth or chamois cloth.



Avoid using abrasive cleansers, strong cleaning solutions or industrial solvents on the outer frame, the rim of the bowl, the rigid disc, tooling or safety covers, as they may be permanently damaged.

"Dusty" Applications

If your parts generate dust or particulate when handled, you'll need to clean the feeder as often as necessary. For such parts, remove the dust from the top surface of the rim of the bowl and the disc with a portable vacuum cleaner or dry compressed air.

Speed Reducer Maintenance

The speed reducer comes with factory installed synthetic lubricants and is lubricated for life and it does not require regular venting. If you have installed a different reducer, please refer to that manufacturer's recommendations for lubrication.

Bearing Lubrication

Bearings On all FR-20 and FR-30 models, grease nipples (zerk fittings) are located on the outside of the upper and lower spindle bearings. Use any lithium grease conforming to NLGI Grade 2 consistency. The grease should be free of dust, particles and abrasives.

Use the maximum grease capacity of the bearings as a guide. The upper spindle bearing can hold up to about 3/8 ounces of grease. The lower spindle bearing can hold up to about 1/8 ounce of grease. Lubrication every six (6) to twelve (12) months, or 1000 operating hours, whichever comes first.



Because of the danger of moving parts, do not lubricate while the feeder is operating!

Chains and Sprocket Lubrication

Chains and Sprockets The drive chain, spindle sprocket and torque limiter sprocket should be greased every six (6) months or every 1000 operating hours, whichever comes first.



- ➔ **Before beginning, disconnect power and air.** Remove the exit cover and exit support assembly to gain access to the feeder. Lock and tag out the feeder.
- ➔ Use standard Moly grease, Lubriplate #3000 (NLGI Grade 2) or the equivalent. Turn the bowl by hand to expose all the links of the bowl drive chains. Use a brush to apply grease to the sprockets and the chains.

Inspect Chain Tension



Step 1—Gain Access. Improper chain tension wears out sprockets and chains. When lubricating or performing other maintenance tasks, inspect the tension of the chain. **If you have not already done so, disconnect power and air**, and remove the exit cover and the exit support assembly to gain access. Lock and tag out the feeder.

Step 2—Inspect Drive Chain. Midway between the spindle sprocket and the torque limiter sprocket, grasp the chain and move it back and forth. You should not be able to move it more than 1/4" in either direction. If it moves more than 1/4", adjustment is required (see Figure 4-1).

Step 3—Loosen Drive Motor. Loosen the mounting bolts of the drive motor.

Step 4—Adjust Tension. Adjust the tension of the drive chain by sliding the motor away (or closer) to the center of the feeder until the proper tension is achieved.

Step 5—Re-Tighten Drive Motor. Tighten the mounting bolts of the drive motor. Replace all safety covers, remove lock out and tag out on the feeder.



Figure 4-1. Chain Tensions

Notes

Repair and Troubleshooting

5

Adjusting Bowl Run Out

Bowl run out needs to be set if the bowl is removed. Adjust run out with power off and drive chain disengaged. For run out specifications, see Chapter 1.



Step 1—Gain Access. **Disconnect power and air.** Remove the cover from the exit area of the feeder.

Step 2—Remove Drive Chain. Remove the master link. Disconnect the drive chain from the spindle shaft sprocket.

Step 3—Adjust Vertical Run Out. Attach a dial indicator to the inside of the feeder frame. Set the indicator contact point vertical, resting on the top of the rim of the bowl, up to 1/4" (6 mm) from the bowl's upper inside diameter (ID). Loosen the jam nuts and locknuts (above and below) each arm of the bowl spider, one arm at a time. Repeat as necessary while checking run out. Don't tighten the jam nuts until Step 4.



Do not adjust spider rim support arms without monitoring run out, because if you misalign any one spider rim support arm, you may damage the feeder bowl.

Step 4—Adjust Horizontal Run Out. Move the indicator contact point horizontal, resting on the inner wall of the bowl, up to 1/4" (6 mm) from the bowl's upper ID. Gently tap the bowl's ID with the palm of your hand or a rubber mallet. Inspect vertical run out and adjust again if necessary. Continue alternating between horizontal and vertical run out until both are within specification. Tighten locknuts and jam nuts by hand firmly but not forcibly.

Step 5—Check Exit. Ensure that the proper relationship still exists at each transition between the rim of bowl and output device (deadplate, conveyor, gravity track or powered rollers, i.e.).

Step 6—Check Backup Ring Clearance. Ensure that the proper as-tooled gap still exists between the bottom of the backup ring and the rim of the bowl.

(Feeders for most product are tooled with approximately 1/8" gap, but for some small product the gap is less; consult your as-built documentation.) Adjust tooling ring up or down if necessary.

Step 7—Replace Chain and Cover. Install drive chain. Inspect chain tension. Replace cover and connect power and air. Feeder is ready for use.

Torque Limiter: Replacement/Adjustment

The torque limiter allows the motor to slip harmlessly in the event of a parts jam. Severe humidity or dryness, lubricants or surface corrosion on bushings or the torque limiter's drive sprocket may reduce the effectiveness of the torque limiter. The torque limiter should be inspected and adjusted if the rim is free wheeling.

Replacement



Step 1—Disconnect Power. **Disconnect power and air** in such a way to prevent accidental reactivation.

Step 2—Gain Access. Remove exit cover and drive chain for the rim.

Step 3—Remove Torque Limiter. Remove and disassemble torque limiter. Inspect and replace any broken or worn parts. Observe order of components (see Figure 5-1).

Step 4—Assemble Torque Limiter. Assemble the torque limiter. Tighten adjusting nut by hand. Do not completely flatten the disk spring.

Step 5—Replace Chain Tension. Replace the chain and inspect chain tension (refer back to Chapter 4, Adjusting Chain Tension).

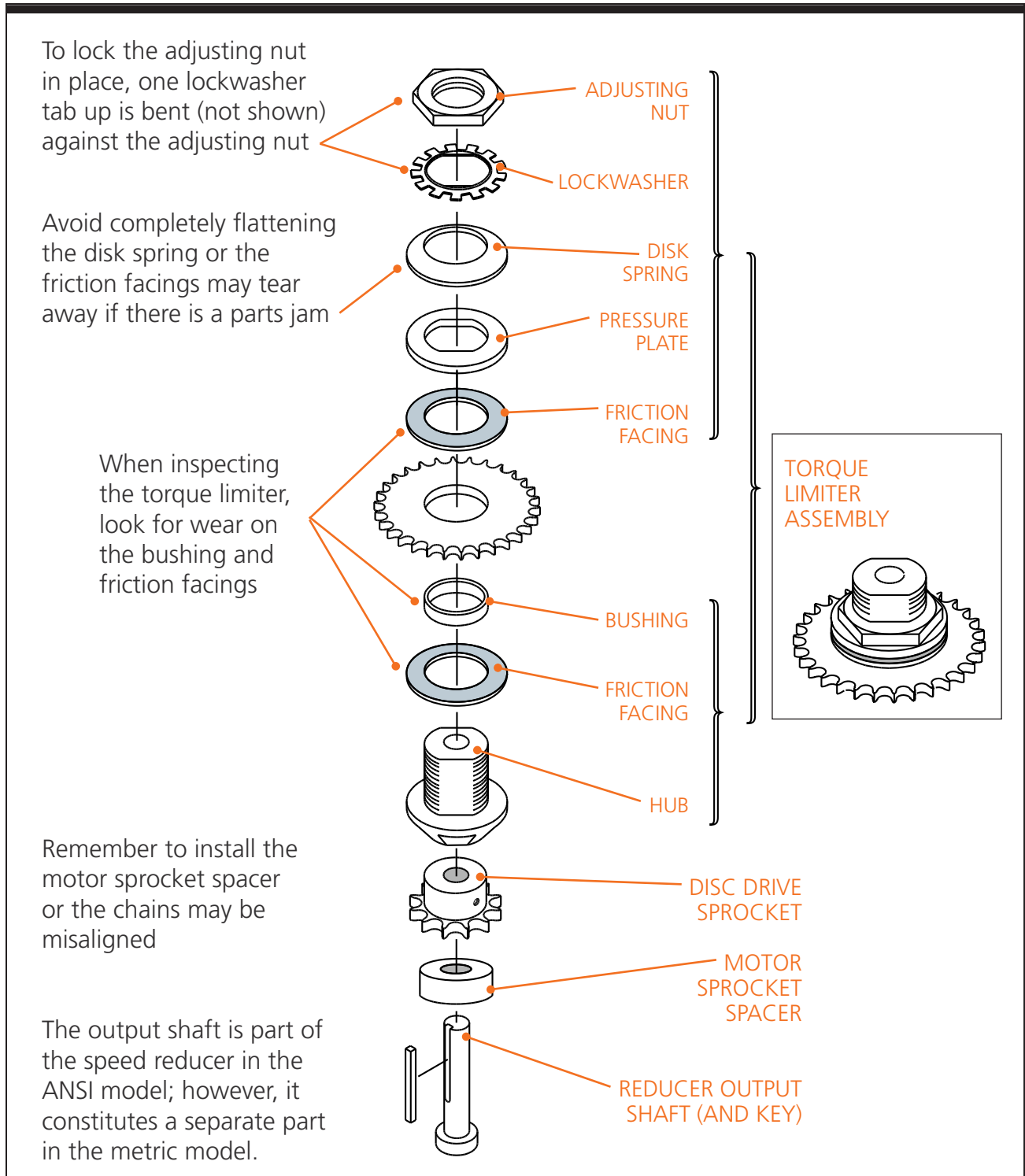


Figure 5-1. Torque Limiter Assembly (Exploded View and Assembled View)

Adjusting Backup Ring Clearance

A number of design improvements were made to all models (cold rolled and stainless steel, ANSI and metric) of the FR-20 and FR-30 that affect the backup ring clearance adjustment of the units listed below.

"Older Style" Serial Numbers		
*If your serial number is lower than that listed, your feeder is "OLDER STYLE"		
Feeder Style	FR-20 Serial Number	FR-30 Serial Number
Cold Rolled Steel, ANSI	15624	16483
Stainless Steel, ANSI	14282	16218
Cold Rolled Steel, Metric	15624	16398
Stainless Steel, Metric	15624	N/A

Table 5-1. Older Style Model Serial Numbers

Refer to Table 5-1 above to determine if your feeder qualifies as an "older" style then follow the "OLDER STYLE Backup Ring Clearance Adjustment Procedure". If your feeder is "newer" then follow the CURRENT STYLE Backup Ring Clearance Adjustment Procedure on the next page.

OLDER STYLE Backup Ring Clearance Adjustment Procedure

If it becomes necessary to adjust the backup ring clearance of an FR-20 or FR-30 feeder that contains an older style tooling frame, you must change the backup ring clearance by raising or lowering the entire bowl and spindle shaft assembly.



Step 1—Disconnect Power. Turn off power and ensure it can't be accidentally reactivated.

Step 2—Gain Access. Remove the cover from the exit area of the feeder.

Step 3—Check Bowl Run Out. Check that bowl run out is within tolerance. (See Adjusting Bowl Run Out, page 20.)

Step 4—Loosen Lockscrew. Loosen the lockscrew in the threaded clamp collar at the bottom of the spindle shaft. This is located directly above the lower spindle bearing (see Figure 5-2).

To change the clearance between the backup ring and top rim of the bowl on the older style FR-20/30, loosen the threaded clamp collar on the lower spindle bearing. Next turn the threaded spindle shaft while holding the lower spindle bearing's threaded clamp collar stationary.

- ➡ To lower the bowl, turn clockwise (CW).
- ➡ To raise the bowl, turn counterclockwise (CCW).

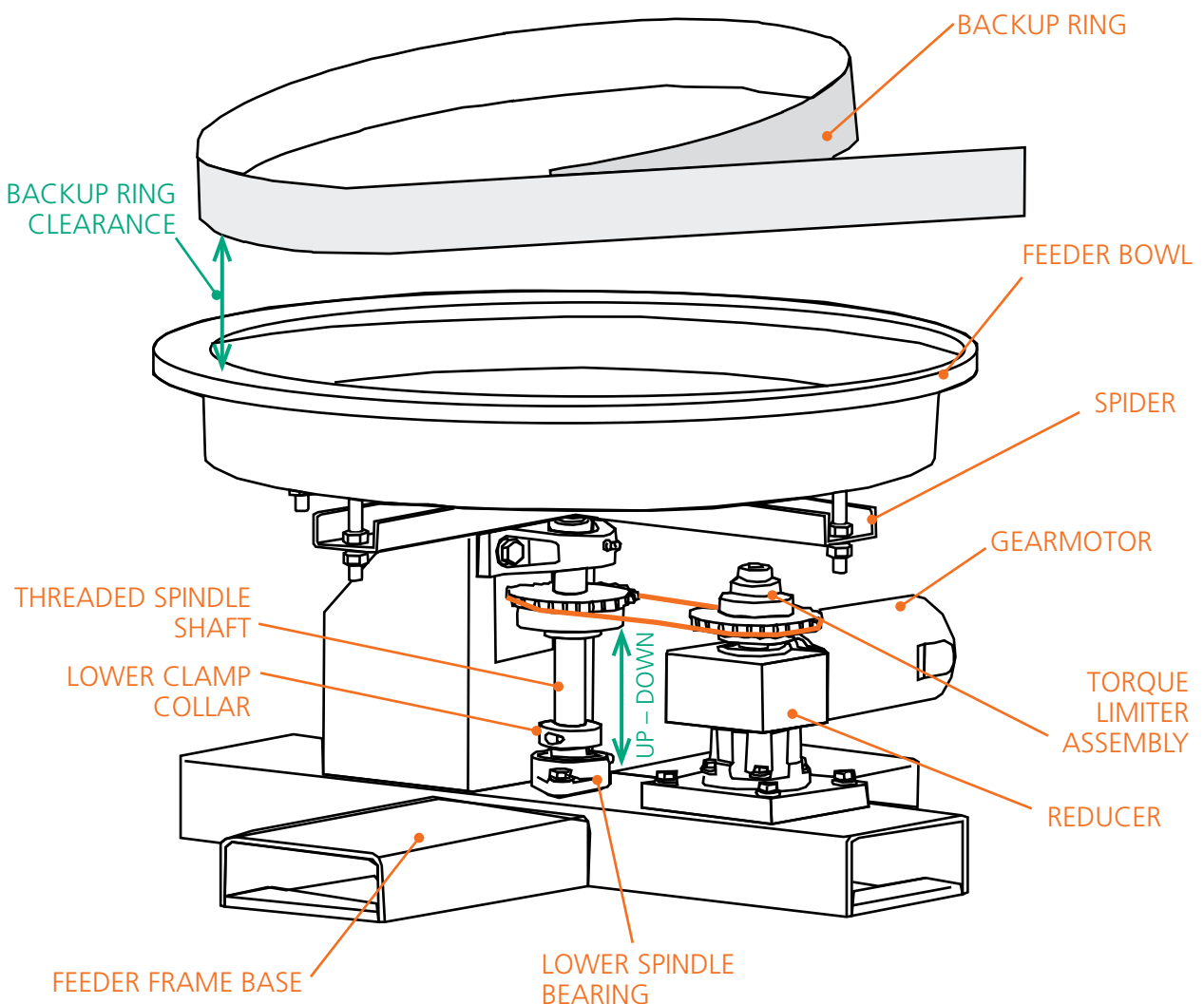


Figure 5-2. OLDER STYLE Backup Ring Clearance Adjustment

Step 5—Check Backup Ring Clearance. There must be enough clearance between the backup ring and the top surface of the bowl rim for the feeder to operate properly. If you have as-built tooling documentation from the dealer or OEM that tooled the feeder, adjust the clearance to that shown on the as-built tooling documentation. Otherwise, consult an authorized Hoppmann dealer or OEM service technician.

Step 6—Raise or Lower the Bowl. To raise the bowl, hold the threaded clamp collar while turning the bowl counterclockwise. To lower the bowl, hold the threaded clamp collar while turning the bowl clockwise.

Step 7—Tighten Loose Screws. Tighten clamp collar lockscrew when desired bowl height is attained.

Step 8—Readjust Spindle Sprocket (if necessary). If the bowl is raised more than 1/16" (1.5 mm), readjust the spindle sprocket to the same height as the friction clutch sprocket, or the drive chain may jerk or bind.

Step 9—Replace Safety Covers. Check your work. Replace all safety covers. Feeder is ready to run.

CURRENT STYLE Backup Ring Clearance

To adjust the backup ring clearance on "CURRENT STYLE" FR-20 or FR-30 (refer to Table 5-1 for clarification) the adjustment occurs at the four adjustment points around the top of the feeder (see Figure 5-3). Access the adjustment points to raise the square tooling frame and everything connected to it, including the backup ring. This is an improvement over the older style tooling frame.



There must be enough clearance between the backup ring and the top surface of the bowl rim for the feeder to operate properly. If you have as-built tooling documentation from the dealer or OEM that tooled the feeder, adjust the clearance to that shown on the as-built tooling documentation. Otherwise, consult an authorized Hoppmann dealer or OEM service technician.

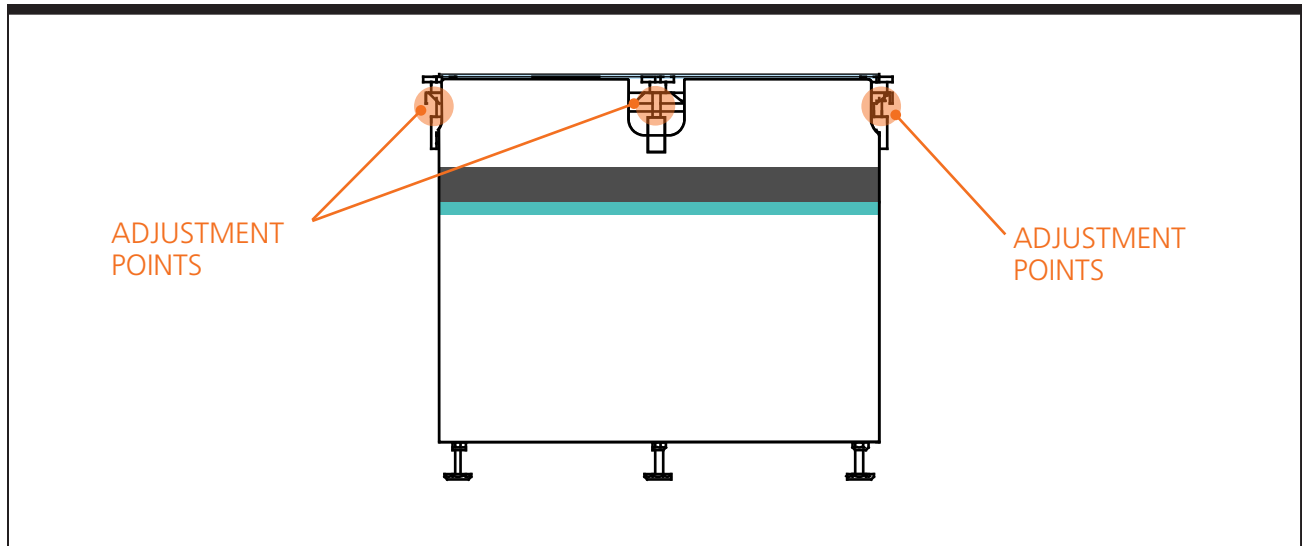


Figure 5-3. CURRENT STYLE Backup Ring Clearance Adjustment

Removing Bowl For Machining/Replacing

The FR series centrifugal feeder comes with one of two styles of bowl: Standard on the FR-20 is a solid, cast urethane bowl; the FR-30 standard bowl is an injection foam urethane bowl. The FR-30 injection foam urethane bowl should not be modified. If you wish to remove and machine or replace the bowl because of damage, follow the procedure below (see also Figure 5-4 and 5-5).

Step 1—Turn Off Power. Turn off power. Remove the FR-20 or FR-30 feeder's bowl.

Step 2—Replace Bowl. If the FR-30 standard bowl has been damaged, replace it with a new bowl. An optional, solid cast urethane bowl is available which can be machined if desired. Mounting hardware is provided with the replacement bowl. Note that unlike the FR-30, all versions of the FR-20 are supplied with a solid case urethane bowl that can be machined if needed.



Do not machine the FR-30 standard injection foam urethane bowl, as modifications will remove the hard outer layer and expose the foam inner core, making the bowl unusable.

Step 3—Machine Bowl (if necessary). Machine the bowl as necessary.

Step 4—Set Bowl Runout. Replace the bowl. After putting the bowl in place, first set the bowl elevation to the correct height $\pm 0.03''$ (0.8 mm). Next, set bowl runout, and check backup ring clearance. Check that all safety covers are in place before returning the feeder into service.

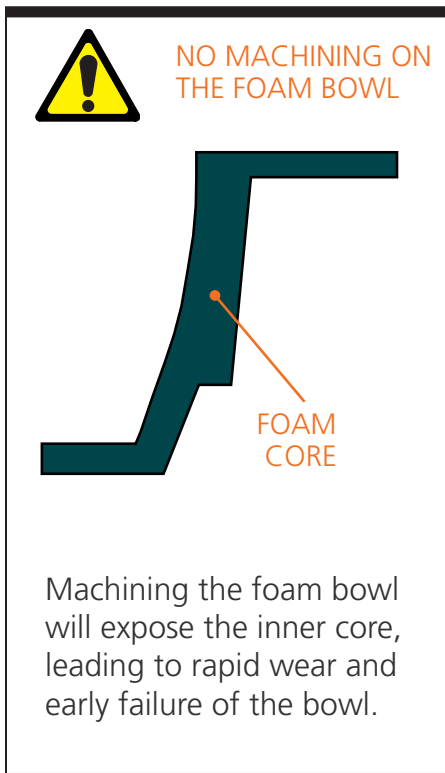


Figure 5-4. Foamed Polyurethane Bowl (Black)

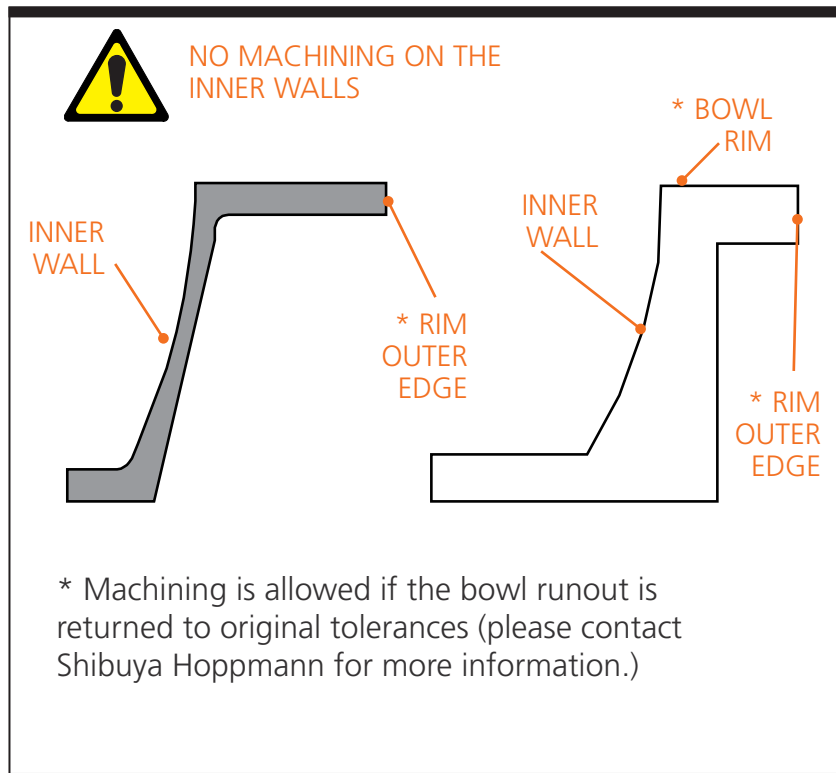


Figure 5-5. Cast Stainless Steel Bowl (Left) and Cast Polyurethane Bowl – FDA White or Optional Black (Right)

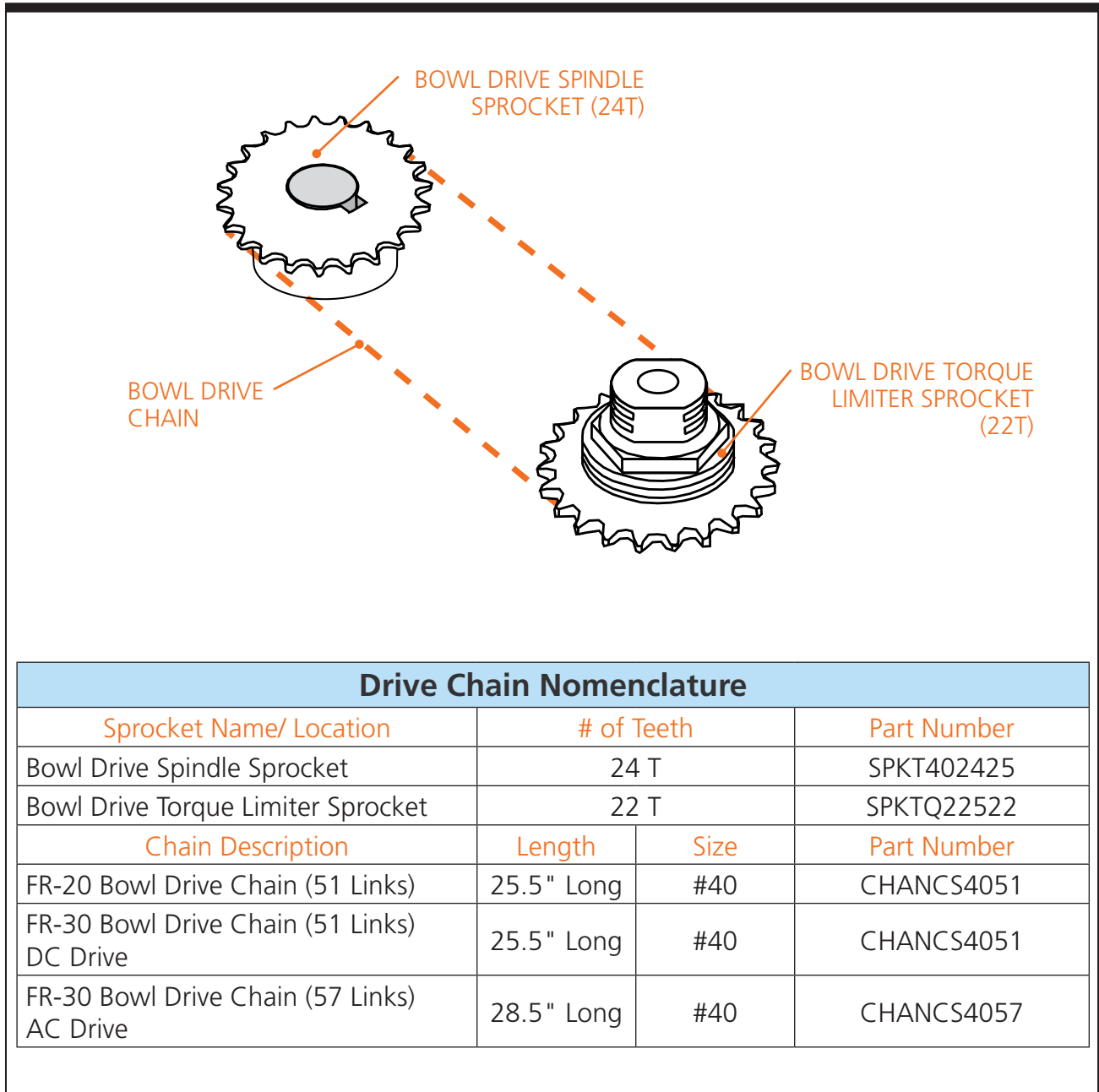


Figure 5-6. FR-20 and FR-30 Feeder Drive Sprocket Location/Descriptions

If Parts Jam: General Tips

Step 1—Inspect The Feeder. If parts jam repeatedly, review the following:

- ➔ Is the prefeeder delivering too much product? (The prefeeder should deliver only enough product to the feeder to keep the line running at the required rate.)
- ➔ Is the feeder's bowl speed set incorrectly?
- ➔ Is there a changeover procedure you have overlooked?
- ➔ Is the feeder's main air regulator set incorrectly?

Step 2—Inspect Your Product. After checking the feeder, check to see if your product has changed since the last batch:

- ➔ Are they larger? Smaller? A different shape? A different material? Different color? Different quality?
- ➔ If you are orienting freshly molded product, have you made a change in how they are released from the mold? (Are they hotter, drier or stickier, for example?)
- ➔ Finally, if your product has changed, or if you cannot isolate why your product is jamming, contact your direct supplier for assistance.

Troubleshooting Charts

Please refer to the following pages for the troubleshooting charts.

Troubleshooting		
Problem	Possible Cause	Solution/Action
Feeder won't run at all.	Power is off, or the feeder has been disconnected.	Turn the power on or reconnect power to the feeder.
	Downstream machinery is completely full.	Clear downstream machinery.
	Motor speed controller internal setting changed or defective.	Check the setting and/or replace the motor speed controller and the horsepower resistor.
	Trim pot settings have changed.	Re-calibrate to the motor speed controller manufacturer's specifications.
	Motor is defective.	Replace the motor. Refer to the Replacement Parts in Chapter 6.
Feeder rim or disc does not turn.	Parts jammed in the feeder.	Disconnect power. Locate and remove the jammed part(s). Restart the feeder.
Rate is too low – Parts exit the feeder correctly.	Feeder is "starved" for parts.	Correctly set the prefeeder rate. Make sure there are sufficient parts in the prefeeder hopper.
	Feeder is overloaded.	Check the prefeeders speed. Check the prefeeder's time delay relay. Check the bowl level sensor in the feeder.
	Feeder rim speed is incorrect.	Check that the rim speed is set correctly.
Rim, bowl and/or disc jerks when moving.	Motor speed controller internal setting changed or defective.	Check the setting and/or replace the motor speed controller and the horsepower resistor.
	Trim pot settings have changed.	Re-calibrate to the motor speed controller manufacturer's specifications.
	The drive chain is too loose or too tight.	Adjust the drive chain tension. Refer to Chapter 4 for correct setting information.

Troubleshooting		
Problem	Possible Cause	Solution/Action
Rim and disc turn, but parts do not exit properly. Parts continue to jam in the feeder.	The motor speeds are incorrectly set.	Correctly set the rim speed and prefeeder rate.
	Air is not on to the feeder.	Make sure there are sufficient parts in the prefeeder hopper. Check the air pressure at the main air pressure regulator. Check to make certain the correct flow is set. Adjust as needed.
	Incorrect (wrong) parts are being run.	Verify that the feeder is correctly set up to run this specific part.
	Parts are different.	Check to make sure the feeder is tooled for this part. See if there are differences in the part (ie: stickier, hotter, etc.)
	Tooling or air jets need adjustment.	Refer to your Systems Operation manual or contact your direct supplier.
Cannot adjust the motor speed high enough.	Motor speed controller internal setting changed or defective.	Check the setting and/or replace the motor speed controller and the horsepower resistor.
	Trim pot settings have changed.	Re-calibrate to the motor speed controller manufacturer's specifications.
	The drive chain is too loose or too tight.	Adjust the drive chain tension. Refer to Chapter 4 for correct setting information.
Surface of the parts is scuffed up or dirty.	Particulate (dust, dirt, etc.) is in the feeder.	Clean the feeder (refer to Chapter 4, Preventive Maintenance, for routine cleaning).
	Parts are already scuffed.	Check upstream equipment.

Replacement Parts

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Replacement Parts

Replacement parts lists for the Hoppmann FT-40-RD, FT-50-RD and the FT-60-RD Centrifugal Feeders are listed on the following pages. When ordering replacement parts, please reference the model name and number of your feeder located on the serial plate (see Figure 6-1). This helps in making sure you receive the correct replacement parts.

If you received a customized Shibuya Hoppmann system, please refer to your system's Operation Manual when ordering spares, as your system may have been altered.

Having the serial number in addition to the part number you wish to order will help us to accurately assist you in getting the correct parts. You may order your feeder's spare parts directly from Shibuya Hoppmann by email, phone or fax (see the contact information listed below).

Shibuya Hoppmann Spares and Service Department

- ➔ **Email:** Spares@Hoppmann.com
- ➔ **Phone:** 434.929.4746 (800.543.0915)
- ➔ **Fax:** 434.929.4959
- ➔ **Mail:** Shibuya Hoppmann Corporation
Attn: Spares Department
291 Dillard Road, P.O. Box 879
Madison Heights, VA 24572 USA
www.ShibuyaHoppmann.com

Shibuya Hoppmann™

SERIAL # _____ DATE _____

MODEL # _____

INVENTORY # _____

PROJECT NUMBER _____

www.shibuyahoppmann.com • (800) 368-3582

Figure 6-1. Sample Serial Plate [2014]

Critical FR-20 Centrifugal Feeder Replacement Parts		
Part Number	Description	Qty.
NMRV30M030	AC/DC Drive: Speed Reducer, 30:1, M63B14	1
MOTRP.20HP	DC Drive: 1/5hp DC Motor, 90VDC	1
MOTRMAC.25	AC Drive: 1/4hp AC Motor, 220/380 VAC, 3 Phase	1

FR-20 Centrifugal Feeder Replacement Parts		
Part Number	Description	Qty.
BRNGFLGM01	Bearing (Lower Spindle Bearing)	1
BRNGPILM01	Pillow Block Bearing (Upper Spindle Bearing)	1
SPKT402425	Sprocket, 25mm SSKW (Bowl Drive Spindle Sprocket)	1
SPKTQ22522	Sprocket Ground TL #40x22 (Torque Limiter Sprocket)	1
CHANCS4051	#40 Chain, 51 Links, 25.5" Long	1
MOLDVAC011	Cover, Center Cap	1
FT20DPBOWL	Deep (Feeder) Bowl	1
TORQ225M14	Torque Limiter, OSD225, 14mm FB	1
FR300M0002	Shaft Reducer, FR20/30	1
FR20000501	Disc, Modified FT Vacuum Formed for FR20	1
FR30000502	Disc Clamp, FR30 w/FT Disc	1
FR20SM0600	Spindle Shaft Weldment	1
FOOTM12100	Level Foot, M12x100mm Long Stainless Steel	4

Please note that this list may not apply to all variations of your feeder. Please refer to your serial plate for additional information, and provide the serial number information to the Customer Service Representative when requesting spares.

BLUE = DC MOTOR (FR20XXXDSA)
RED = AC MOTOR (FR20XXXASA)

Critical FR-30 Centrifugal Feeder Replacement Parts

Part Number	Description	Qty.
NMRV30M030	AC/DC Drive: Speed Reducer, 30:1, M63B14	1
MOTRP.20HP	DC Drive: 1/5hp DC Motor, 90VDC	1
MOTRMAC.25	AC Drive: 1/4hp AC Motor, 220/380 VAC, 3 Phase	1

FR-30 Centrifugal Feeder Replacement Parts

Part Number	Description	Qty.
BRNGFLGM01	Bearing (Lower Spindle Bearing)	1
BRNGPILM01	Pillow Block Bearing (Upper Spindle Bearing)	1
SPKT402425	Sprocket, 25mm SSKW (Bowl Drive Spindle Sprocket)	1
SPKTQ22522	Sprocket Ground TL #40x22 (Torque Limiter Sprocket)	1
CHANC54051	#40 Chain, 51 Links, 25.5" Long	1
CHANC54057	#40 Chain, 57 Links, 28.5" Long	1
MOLDVAC011	Cover, Center Cap	1
FT30DPBOWL	Deep (Feeder) Bowl	1
TORQ225M14	Torque Limiter, OSD225, 14mm FB	1
FR300M0002	Shaft Reducer, FR20/30	1
FR30000501	Disc, Modified Ft Vacuum Formed for FR	1
FR30000502	Disc Clamp, FR30 w/FT Disc	1
FR30SM0510	Spindle Shaft Weldment	1
FOOTM12100	Level Foot, M12x100mm Long Stainless Steel	4

Please note that this list may not apply to all variations of your feeder. Please refer to your serial plate for additional information, and provide the serial number information to the Customer Service Representative when requesting spares.

BLUE = DC MOTOR (FR30XXXDSA)

RED = AC MOTOR (FR30XXXASA)

Warranty

7

Warranty

Shibuya Hoppmann Corporation warrants that each item of its own manufacture delivered hereunder shall, at the time of delivery and for a period of twelve (12) months thereafter, be free from defects in materials or workmanship; and if any such item shall prove to be defective in material or workmanship under normal intended usage and maintenance during the warranty period, upon examination by Shibuya Hoppmann Corporation, then Shibuya Hoppmann Corporation shall repair or replace, at its sole option, such defective item at its own expense; provided, however, that the owner shall be required to ship such defective item, freight prepaid, to Shibuya Hoppmann Corporation's plant in Madison Heights, Virginia. The warranty on components not manufactured by Shibuya Hoppmann Corporation, but a part of the feeder, is limited to the warranty provided by the original manufacturer of said components to the extent, and only to the extent, that such original manufacturer actually honors such warranty.

ALL WARRANTIES HEREUNDER ARE EXPRESSLY LIMITED TO THE REPAIR OR REPLACEMENT OF DEFECTIVE ITEMS AS SET FORTH HEREIN, AND IN NO EVENT SHALL SHIBUYA HOPPMANN CORPORATION BE LIABLE FOR SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES BY REASON OF ANY BREACH OF WARRANTY OR DEFECT IN MATERIAL OR WORKMANSHIP. SHIBUYA HOPPMANN CORPORATION SHALL NOT BE RESPONSIBLE FOR REPAIR OR REPLACEMENT OF ITEMS WHICH HAVE BEEN SUBJECTED TO NEGLIGENCE, ACCIDENT OR IMPROPER USE, OR WHICH HAVE BEEN ALTERED BY OTHER THAN AUTHORIZED SHIBUYA HOPPMANN CORPORATION PERSONNEL.

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Shibuya Hoppmann™

Shibuya Hoppmann offers a wide selection of products:

- ➔ Prefeeder/Centrifugal Parts
- ➔ Feeders/Unscramblers
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 - Powder
 - Aseptic
 - Non-Aseptic
- ➔ Multi Part Assembly Systems
 - Continuous Motion
 - Indexing/Intermittent
- ➔ Capping Systems – Servo or Mechanical
- ➔ Placement Systems
- ➔ Rotary/Inline Pressure Sensitive Labelers
- ➔ Print and Apply Labelers
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