

Model FS-30-RD Centrifugal Feeder

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 FS-30-RD Centrifugal Feeders.

Use this manual for the FS-30-RD ANSI or Metric style Centrifugal Feeders, cold rolled steel or stainless steel, single or dual drive systems, manufactured after October, 1996.



Record your serial plate information here for future reference



Model Number	Serial Number/Date

First Edition, Revision 2, All Rights Reserved.
Copyright 2018 by Shibuya Hoppmann Corporation.

Duplication of this manual, in whole or in part, requires prior written consent from Shibuya Hoppmann Corporation.

Headquarters
7849 Coppermine Dr.
Manassas, VA
20109
540.829.2564 t
800.368.3582 t
540.829.1726 f

Sales
1445 Brookville Way
Suite F
Indianapolis, IN 46239
317.322.0754 t
800.368.3582 t
317.322.0794 f

Manufacturing
291 Dillard Road
Madison Heights, VA
24572
434.929.4746 t
800.368-3582 t
434.929.4959 f

Quick Start

About this Manual

Assumptions

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

- ☞ References in this manual may not apply to your 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 FS-30-RD feeder (if any) have been changed, consult your direct supplier's documentation.

Models Covered

This manual covers all FS-30-RD 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.

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. 08.2018.

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 FS-30-RD 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 could adversely affect the performance of your tooled feeder.

Terms and Definitions

Term	Equivalent Term, Definition or Abbreviation
Feeder	Centrifugal Feeder, Sorter, Bowl, Unscrambler, Orienter, Rotary
Feeder Scallop	Scallop rim feeders are used when the parts being fed have a 1.5:1 or greater length-to-width ratio and require a final orientation that is side-by-side, or diameter-to-diameter.
Scallops	Segments of polyurethane designed to fit the machined bowl of the feeder, providing a unique system for orientating containers and other cylindrical shapes.
Tooling	Mechanical and optical devices used to help orient products in the feeder bowl. May include: sensors, height qualifiers, wipers, air jets, etc.

Table of Contents

	Chapter Name	Page
	Quick Start	
	About this Manual	2
	What to Do First / Terms and Definitions	3
	Table of Contents	4
1		
	Feeder Description and Specifications	
	Overview of the FS-30-RD Feeders	7
	Standard Features and Options Available	10
	Figures:	
	Figure 1-1. Typical FS-30-RD Scallop Feeder Exploded View	6
	Figure 1-2. Qualifying Parts in Scallops	7
	Figure 1-3. Exiting the Scallop Feeder	8
	Figure 1-4. FS-30-RD Side and Top Views	9
	Table 1-1. FS-30-RD Dimension Specifications	9
	Table 1-2. FS-30-RD Performance Specifications	10
	Table 1-3. FS-30-RD Electrical Specifications	10
2		
	Safety Precautions	
	Safety Precautions	11
3		
	Operating and Maintenance: Do's and Don'ts	11
3		
	Installation & Start-Up	
	Included in this Chapter	13
	Unpacking, Inspection and Registration	13
	Physical Setup	13
	Starting the Feeder for the First Time	14
	How to Set Proper Bowl Speed	15
	Running Product for the First Time	16
	General Tips	16
	Figures:	
	Figure 3-1. Measuring and Changing Bowl Speeds	15
	Figure 3-2. DC ANSI Suggested Wiring Diagram	17
	Figure 3-3. AC ANSI Suggested Wiring Diagram	18
	Figure 3-4. AC Metric Suggested Wiring Diagram	19
	Figure 3-5. DC Metric Suggested Wiring Diagram	20
4		
	Preventive Maintenance	
	General Cleaning	21
	Speed Reducer Maintenance	21
	Chains and Sprockets Lubrication	22
	Inspecting Chain Tension	22
	Idler Assembly Maintenance	23
	Inspecting/Replacing Motor Brushes	24
	Air Clutch Maintenance	25
	FS-30-RD Drive Nomenclature	25

4	Chapter Name	Page
	Figures:	
	Figure 4-1. Idler Assembly (Exploded and Assembled)	23
	Figure 4-2. DC Motor Brushes	24
	Table 4-1. FS-30-RD Sprocket Identification	25
	Table 4-2. FS-30-RD Drive Chain Identification	25
5		
	Repair and Troubleshooting	
	Refinishing, Replacing or Adjusting the Bowl	27
	Refinishing a Standard Bowl	27
	Replacing a Standard Bowl	28
	How to Set Bowl Run-Out	28
	Speed Reducer Replacement	29
	Air Clutch Assembly Replacement	32
	Major Bearing Replacement	33
	If Product Jams: General Tips	36
	Troubleshooting Charts	36
	Figures:	
	Figure 5-1. Measuring Bowl Gap When Replacing Standard Bowl	27
	Figure 5-2. FS-30-RD Drive Assembly Exploded View	30
	Figure 5-3. Motor Key/Shaft	31
	Figure 5-4. AC Motor Drive Assembly for FS-30-RD	32
	Figure 5-5. FS-30-RD Spindle Assembly	34
	Figure 5-6. FS-30-RD Spindle Assembly Exploded View	35
6		
	Replacement Parts	
	Replacement Parts	39
	FS-30-RD Replacement Parts Lists	40
	Figures:	
	Figure 6-1. Sample Serial Plate	39
7		
	Warranty	
	Warranty	43

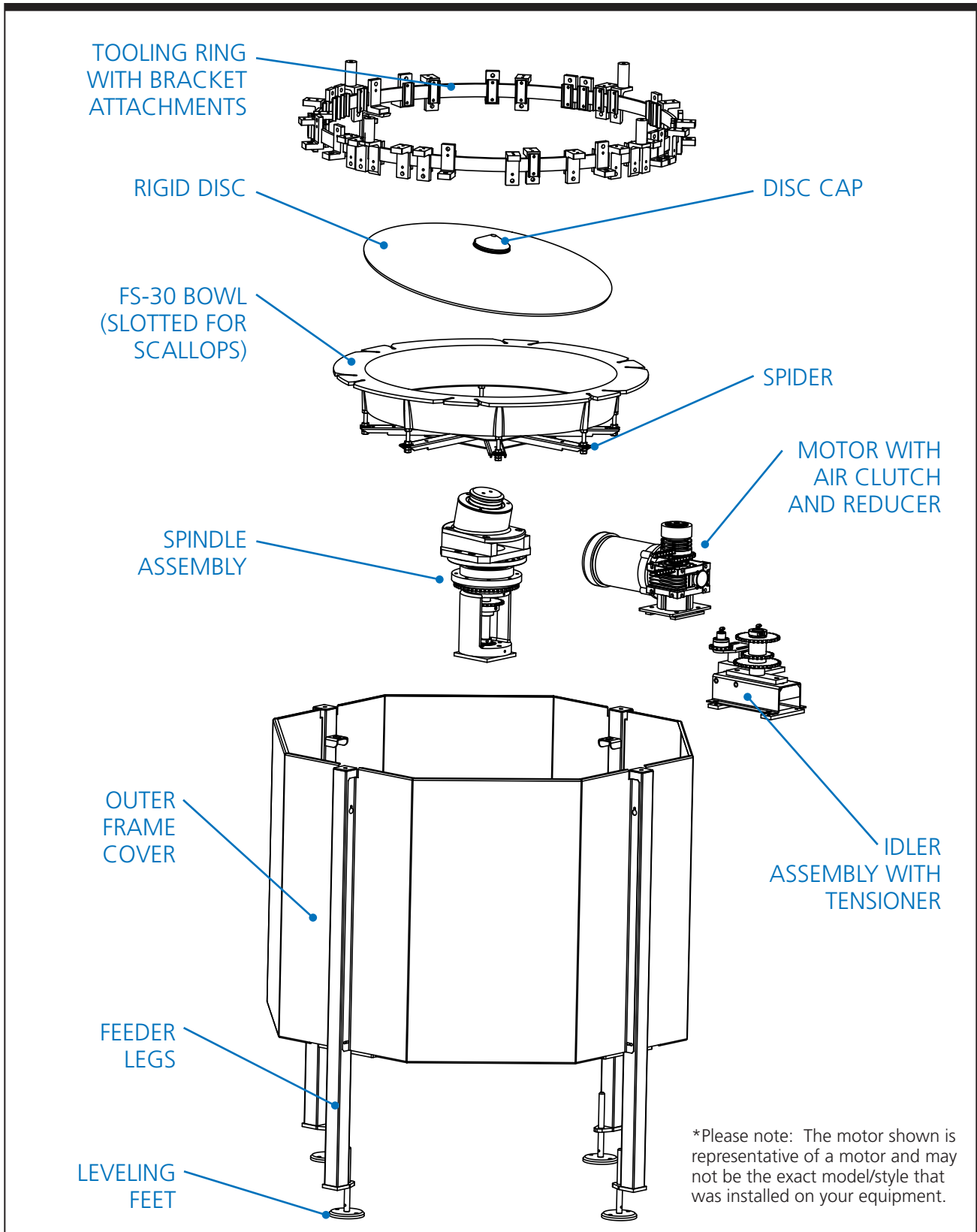


Figure 1-1. Typical FS-30-RD Scallop Feeder Exploded View

Feeder Description & Specifications

1

Overview of the FS-30-RD Feeders

Thank you for purchasing a Hoppmann Centrifugal Feeder. Hoppmann feeders are easy to use, easy to maintain and easily handles your product quietly and rapidly.

Function The FS-30-RD feeders unscrambles, feeds, orients and delivers aligned parts. Every FS-30 feeder operates in the same basic way.

System Equipment The FS-30-RD centrifugal feeders are typically interfaced as a system. First, product is unscrambled from bulk. It is then placed in the proper discharge orientation and released onto an output conveyor. The following pieces of equipment usually comprise a typical "FS" style scallop feeder system: Bulk prefeeder, scallop feeder with tooling, control system, and discharge (exit) conveyor.

Operation Step 1—The Feeder Accepts Your Product. Every feeder accepts product from a separate bulk supply hopper or prefeeder. Product drops randomly, a few at a time, onto a rigid disc.

- ➡ The FS-30-RD feeders run best when parts are not emptied, in bulk, directly onto the rigid disc, but instead, when parts are carefully metered into the FS-30-RD feeder a few parts at a time. The FS-30-RD feeders deliver parts almost immediately.

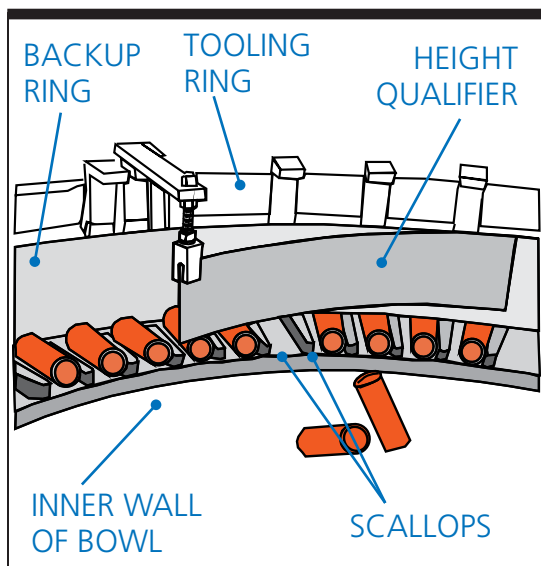


Figure 1-2. Qualifying Parts in Scallops

Step 2—The FS-30-RD Feeder Loads and Qualifies Your Parts. After dropping onto the rigid disc, parts load quickly onto the scalloped rim of a rotating bowl. The parts singulate between scallop fingers which help orient the parts (see Figure 1-2).

- ➡ The rim moves the parts past mechanical, pneumatic and/or optical qualifiers which reject parts that are not nested within the scallops. Improperly nested parts are returned to the bowl and recirculated.

- ➡ Any part of the FS-30-RD feeder that touches your parts has been precision tooled to specifically match your parts, and should be left alone unless absolutely necessary. **Note: This applies to tooled feeders (customized or systemized) only. Do not move tooling or change any settings on the FS-30-RD feeder except as described in this manual, or you may void your warranty and negatively affect the performance of your FS-30-RD Feeder.**

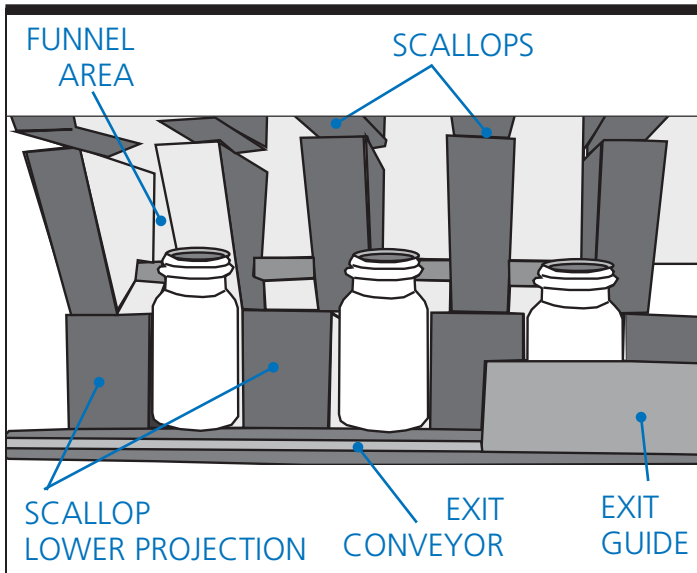


Figure 1-3. Exiting the Scallop Feeder

Step 3—The FS-30-RD Feeder Delivers Your Parts.

After the product has been properly qualified, it is guided to the drop zone where the product is oriented for discharge (see Figure 1-3). Each part is guided by the lower scallops, which hold the product in its final orientation, onto the conveyor¹. The discharge conveyor then moves product out of the FS-30-RD, in proper orientation, for delivery to downstream operations.

Output Feed Rate The FS-30-RD feeder typically handles parts at various output rates depending on your particular part's characteristics and your desired production speed will affect the output rate.

Bowl The standard bowl on the FS-30-RD feeders are cast aluminum.

Scallops The standard scallops are made of cast polyurethane. (Refer to Figure 1-1 for an exploded view of the FS-30-RD feeder).

¹ Conveyors are used a reference only to describe the process of the "typical" scallop feed system. They are not included with the feeder as a standard product.

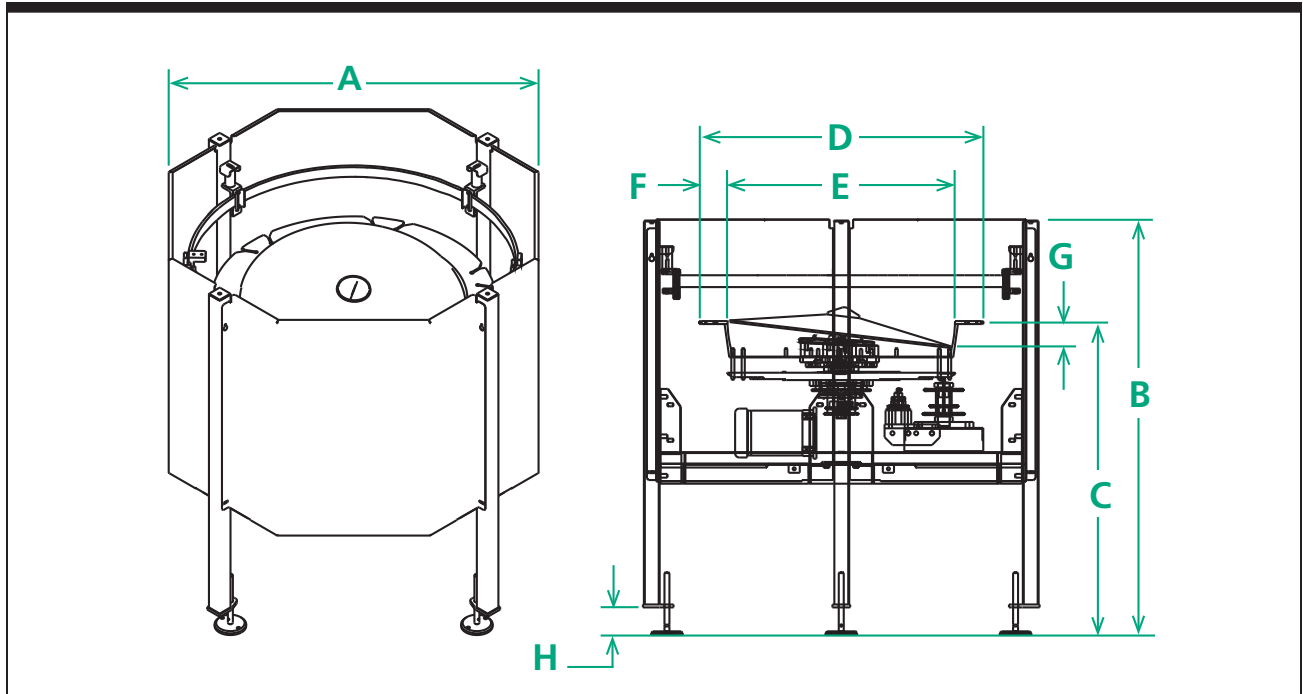


Figure 1-4. FS-30-RD Side and Top Views

Dimension Specifications		ANSI	Metric
A	Outside Dimensions (Square)	50.24"	1276.1mm
B	Overall Height	52.49"	1333.2mm
C	Bowl Discharge Height	39.76"	1010.0mm
D	Bowl Outside Diameter	36.00"	914.4mm
E	Bowl Inside Diameter	28.80"	731.5mm
F	Rim Width	3.60"	91.4mm
G	Bowl Depth	4.60"	116.9mm
H	Level Foot Adjustment *	3.50"	88.9mm
Disc-Bowl Gap		0.015"	0.38mm
Overall Weight (Untooled)		450 lbs.	204 kg

Table 1-1. FS-30-RD Dimension Specifications

* The leveling foot has a vertical adjustment of $\pm 1.75"$, allowing for a height variation between 1.00" and 4.50". This may alter the discharge height.

Standard Features and Options Available

Standard Features The FS-30-RD is standard with all stainless steel exterior construction, an FDA approved ABS vacuum formed disc, a Teflon® hard-coated finished aluminum bowl, air clutch, hinged polycarbonate cover with safety interlocks and backup ring.

Optional Features The FS-30-RD feeder can be easily integrated washdown motor(s), a dual motor drive system, urethane scallop kit and a variety of controllers and operating systems.

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

Performance Specifications	ANSI	Metric
Maximum Bowl Linear Speed (@ Rim ID) ²	72 feet/min	21.2 meters/min
Vertical Bowl Runout (Maximum)	0.010 "	0.254mm
Vertical Disc Runout (Maximum)	0.125 "	3.175mm

Table 1-2. FS-30-RD Performance Specifications

Electrical Specifications	DC	AC
Motor Size	1/3hp	1/3hp
Motor Frame Size	NEMA 56C	56C
Supply Voltage	90 Volts	230/460 ³
RPM	1750	1725
Power Usage	5 Amps	3 Amps

Table 1-3. FS-30-RD Electrical Specifications

² Maximum speed is not the operating speed. This is provided as a reference value only. Bowl Max Speed is 9.5RPM; Disc Max Speed is 14.22RPM

³ 3 Phase, 60 Hertz supply voltage for AC motor.

Safety Precautions

2

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 FS-30-RD feeder. For your convenience, Table 1-1 and Table 1-3 in Chapter 1, 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.

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, if necessary, once the feeder is running.

Step 5—Connect Electrical Supply and Air. Connect your feeder to electrical supply and compressed air (if applicable).

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).

- ➔ If you have only one drive motor installed (standard) you can ignore the rigid disc speed, which changes proportionally as the bowl speed changes.

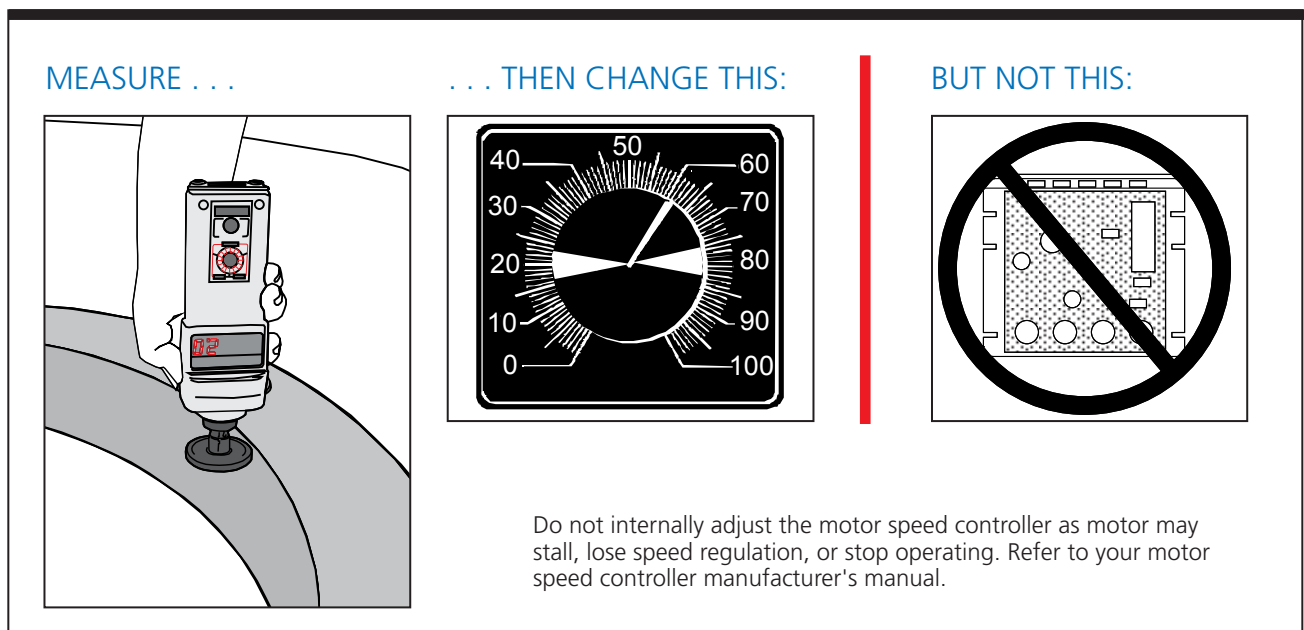


Figure 3-1. Measuring and Changing Bowl Speeds

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

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.

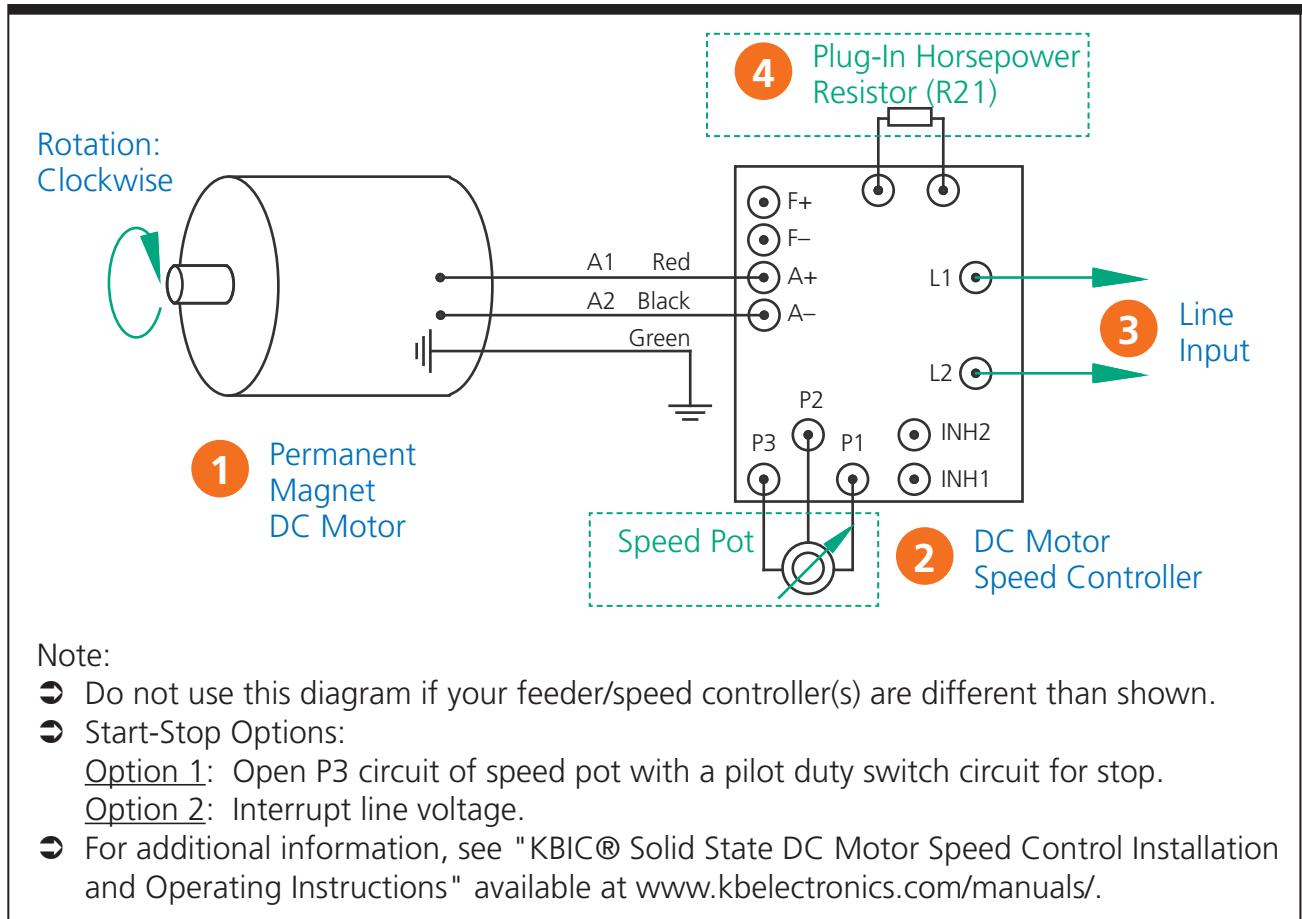


Figure 3-2. DC ANSI Suggested Wiring Diagram (FS-30-RD Single DC Motor)

Specifications - FS301RLDSA	Description	Part Number
1 Motor	1/3hp DC Motor, 90VDC	MOTRP.33HP
Gear Reducer	Speed Reducer, 100:1, 56C	NMRV500100
2 DC Motor Speed Controller	90VDC Motor Controller	CNTRKBIC01
3 Line Input	115 VAC	N/A
4 Plug In Horsepower Resistor (R21)	0.05 OHM, 1/3hp	RESIKB.005

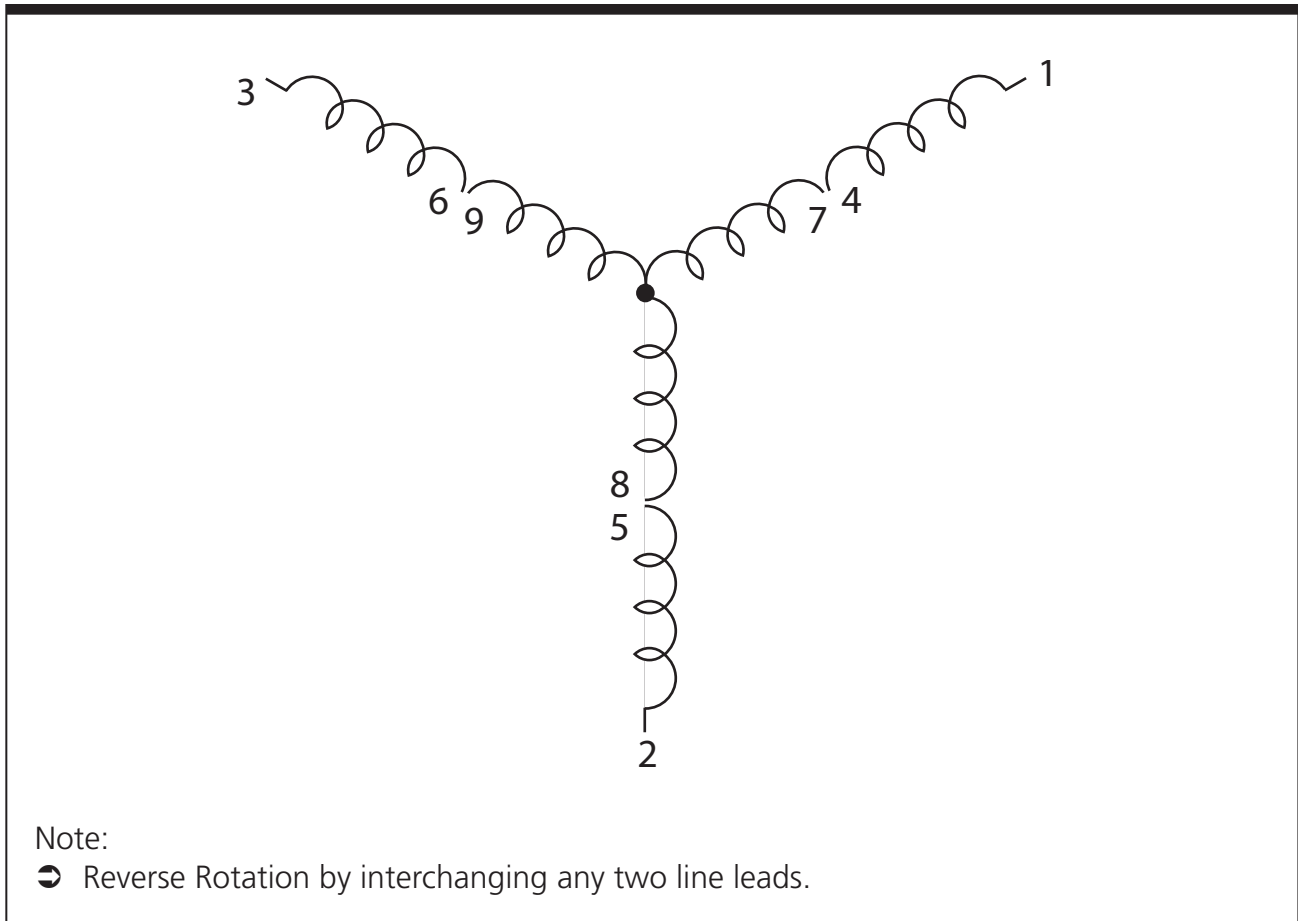


Figure 3-3. AC ANSI Suggested Wiring Diagram (FS-30-RD Single AC Motor)

Specifications - FS301RLASA						
For	Line			Tie Leads	Tie Leads	Tie Leads
	"A" to	"B" to	"C" to			
Low Voltage	3 & 9	2 & 8	1 & 7	6, 5 & 4	--	--
High Voltage	1	2	3	6 & 9	5 & 8	4 & 7

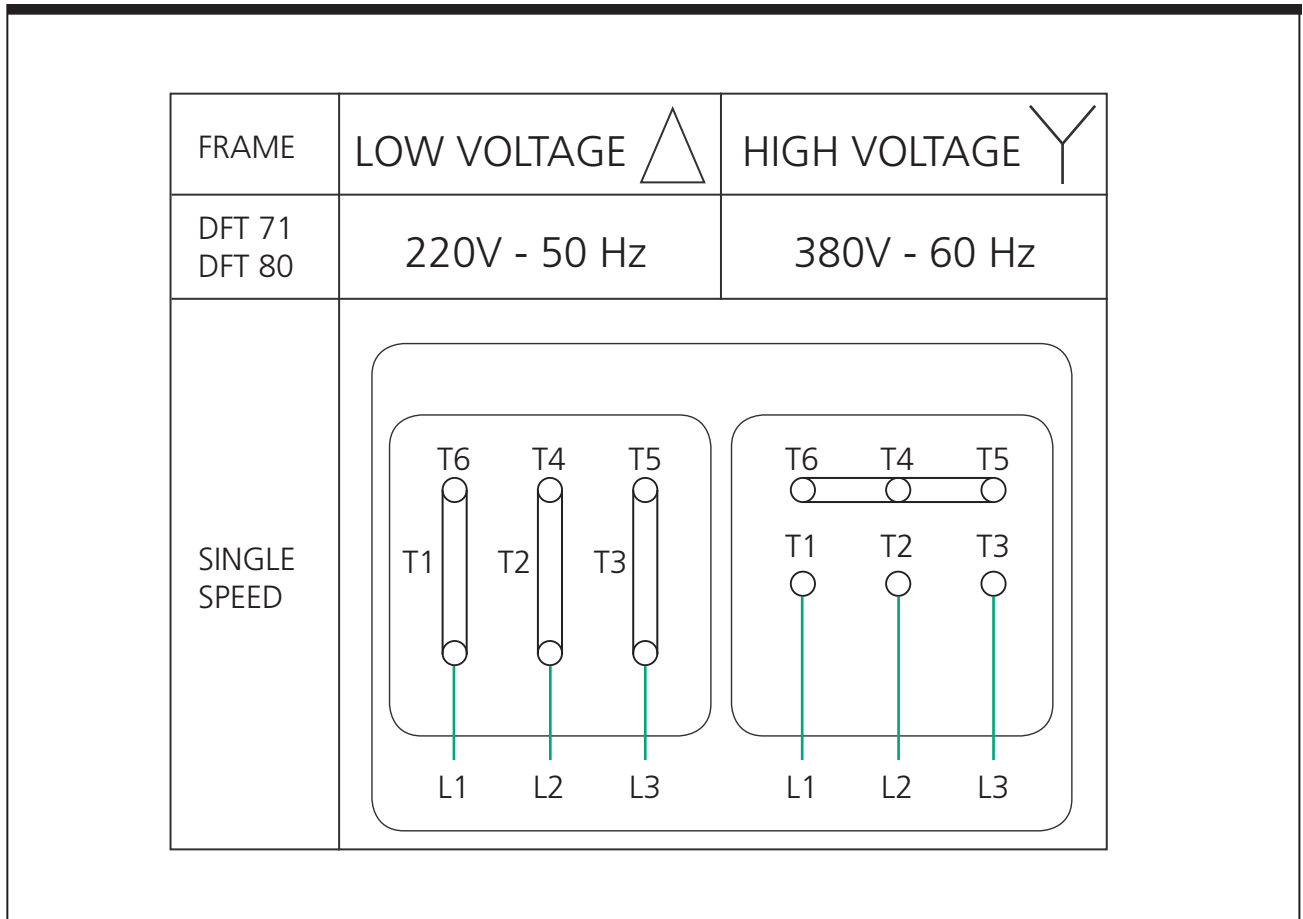


Figure 3-4. AC Metric Suggested Wiring Diagram (FS-30-RD Single AC Motor)

Specifications - FS301RLASM	Description	Part Number
Motor	1/3hp, 230/460 AC Motor	MOTRMAC033-M
Mounting	IEC 71D Face Mounting	N/A
Protection Level	IP 54 Protection Level	N/A
Inverter Option	AC Variable Speed Inverter option (not provided with unit). Contact Shibuya Hoppmann for inverter specifications and ordering instruction, if desired.	

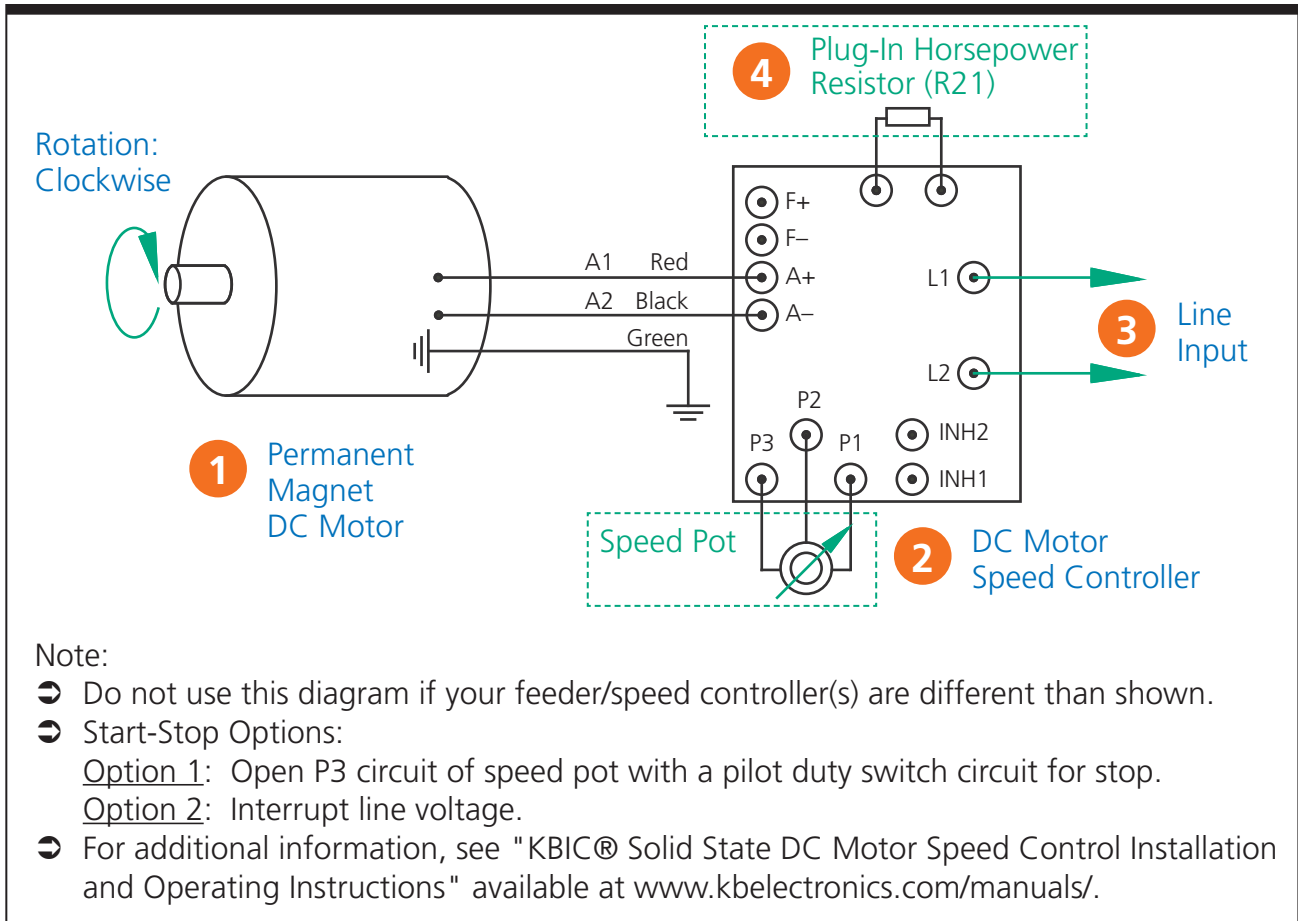


Figure 3-5. DC Metric Suggested Wiring Diagram (FS-30-RD Single DC Motor)

Specifications - FS301RLDSM	Description	Part Number
1 Motor	1/3hp DC Motor	MOTRP.33HP
Gear Reducer	Speed Reducer, 100:1, 56C	NMRV500100
2 DC Motor Speed Controller	180VDC Motor Controller	CNTRKBIC02
3 Line Input	230 VAC	N/A
4 Plug In Horsepower Resistor (R21)	0.05 OHM, 1/3hp	RESIKB.005

Preventive Maintenance

4

General Cleaning

Outer Frame & Tooling

The Shibuya Hoppmann Model FS-30-RD Centrifugal Feeder is 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.

Chains and Sprocket Lubrication

On all FS-30-RD feeders, grease the disc and rim drive chains and sprockets every six 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.

Step 2—Inspect Drive Chain. Midway between sprockets, grasp each chain and move it back and forth. You should be able to move it no more than a total of 1" (25 mm).

- ➔ If adjustment is needed, adjust the disc drive chain first. Loosen the idler assembly (see Figure 4-1), move the chain forward or back as necessary, and then retighten.
- ➔ Adjust the bowl drive chain last. Loosen the reducer mounting brackets from the nut plates, move the reducer forward or back as necessary, and then retighten.

Step 3—Check for Parallel Sprockets. Check that each set of sprockets is parallel to within 1/32" (0.8 mm). If not parallel, only realign the idler sprockets.

Step 4—Check for Vibration. Run the feeder. If vibration is evident, check chain tension for excessive tightness. Vibration may be reduced or eliminated by the realignment of sprockets and increase of total chain deflection from 1" (25 mm) to 1 1/4" (32 mm).

Step 5—Replace Covers. Replace covers and connect power and air. Initial and date the Maintenance Log.

Idler Assembly Maintenance

It is recommended that you grease the idler assembly every six (6) months after installation. If you must disassemble the idler, please refer to the order of assembly in Figure 4-1.

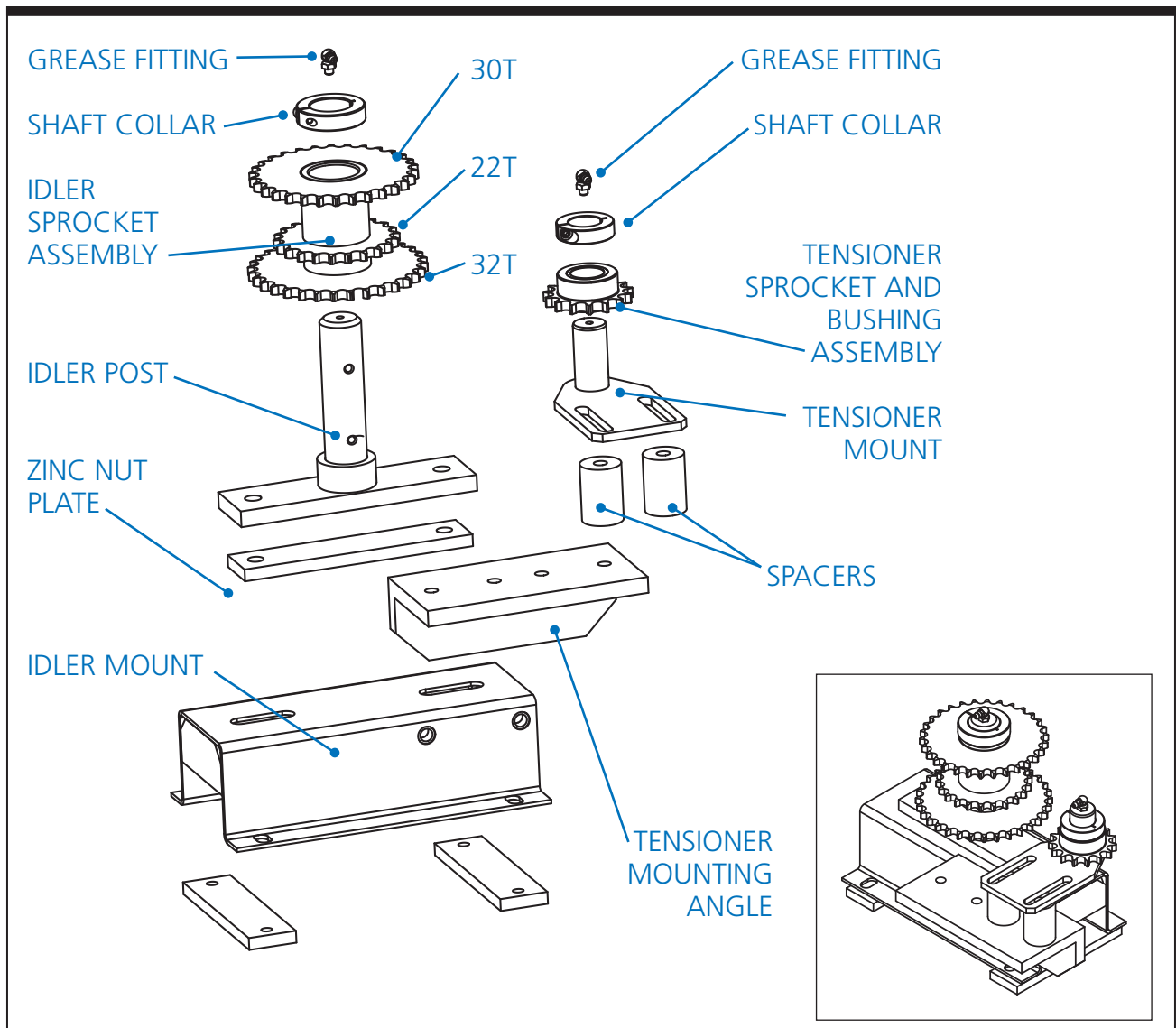


Figure 4-1. Idler Assembly - Exploded and Assembled - FS-30

Inspect/Replace Motor Brushes



The following procedure applies only to DC motors and should be performed only by qualified personnel.



Step 1—Record Brush Length. To prevent motor damage, brushes should be replaced when or before they reach half the original length. **Inspect brush length when equipment is new, and record new brush length. Indicate 1/2 that length as the replacement mark.**



Step 2—Gain Access. Disconnect power and air. Remove feeder covers as needed to gain access to the motor, then remove the motor brush access covers. Lock out and tag out the system.

Step 3—Clean the Motor. Clean the motor by blowing into the open access hole with compressed air. **Eye protection should be worn to prevent any particles from blowing into the eyes.**

Step 4—Replace Brushes. Lift the brush spring from the end of the brush (see Figure 4-2). Remove the brush connector, withdraw the brush and inspect the length. To prevent motor damage, brushes should be replaced when or before they reach the half way point. Reverse procedure to replace brush. Replace motor access and feeder covers. Connect power and air. Initial and date the Maintenance Log.

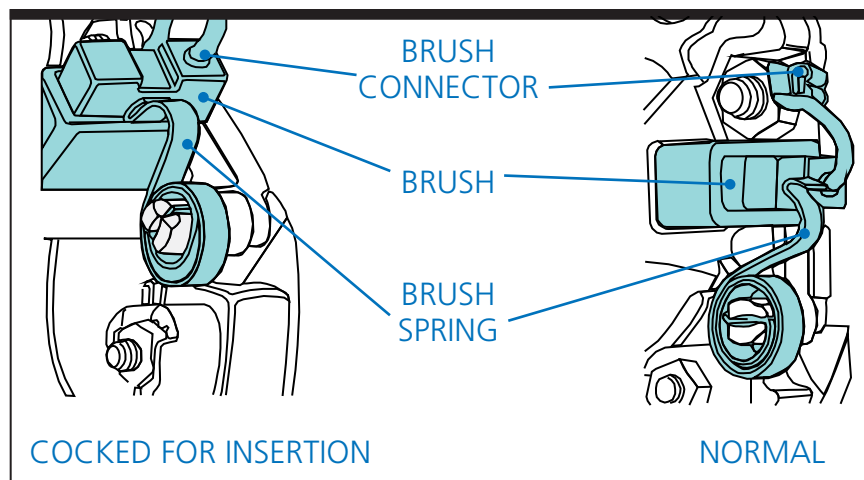


Figure 4-2. DC Motor Brushes with Gasketed Cover Removed

Air Clutch Maintenance

The pneumatic air clutch requires clean, pressure regulated air for the maximum performance and life of the clutch. The seals in the clutch are lubricated for life and do not require additional lubrication.

If you prefer to use an air line lubricator which injects oil into the pressurized air, it is recommended to use a low viscosity oil such as SAE-10. Do not use synthetic lubricants.

The bearings in the clutch are shielded and pre-lubricated and do not need further lubrication.

FS-30-RD Drive Nomenclature

Please refer to Table 4-1 for a list of the sprocket sizes and drive chains for this FS-30 single drive scallop feeder.

Sprocket Name/Location	Teeth
Bowl Drive Spindle Sprocket	45 Teeth
Disc Drive Spindle Sprocket	24 Teeth
<u>Idler Assembly:</u> Bowl Drive Idler Sprocket	30 Teeth
Disc Drive Idler Sprocket	22 Teeth
Air Clutch Drive Idler Sprocket	32 Teeth
Idler Tension Sprocket	15 Teeth
<u>Pneumatic Air Clutch:</u> Air Clutch Sprocket	26 Teeth

Table 4-1. FS-30-RD Sprocket Identification

Chains	DC Motor	AC Motor
Bowl Drive Chain (#40)	44.50" Long	44.50" Long
Disc Drive Chain (#40)	38.00" Long*	38.00" Long*
Air Clutch Drive (#40)	47.50" Long	47.50" Long

* Chain Length is 37.50" Plus 1 Offset Link

Table 4-2. FS-30-RD Drive Chain Identification

Notes

Repair and Troubleshooting

5

Refinishing, Replacing or Adjusting the Bowl

Before making substantial changes to your feeder (refinishing the bowl, removing or replacing the bowl, etc.), please check with your supplier or Shibuya Hoppmann Corporation. At times it may be necessary to remove parts of the system (tooling, air jets, safety covers, etc.), and you may need to document locations in order to put them back in their proper order for correct feeder function.

Refinishing a Standard Bowl

If the standard aluminium bowl becomes damaged in a way that adversely affects the feeder performance the bowl may be refinished.

- ➡ If the damage is slight, re-coating with commercial hard coat by a professional metal refinisher may correct the problem.
- ➡ Machining must be done in such a way that bowl runout is restored to original tolerances, or the feeder may not operate correctly.
- ➡ If machining enlarges the inner diameter of the bowl, you may need to replace the disc with a larger one (custom-sized) from your direct supplier. If you do not obtain a larger disc, the gap between the disc and the inner diameter of the bowl may pinch or snag product (see Figure 5-1).

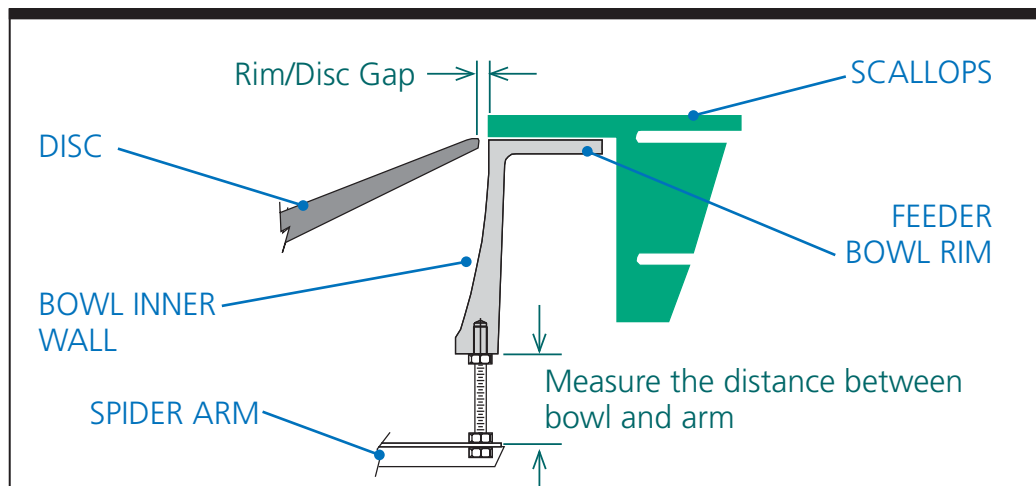


Figure 5-1. Measuring Bowl Gap When Replacing Standard Bowl

Replacing a Standard Bowl

To remove and replace the feeder bowl, follow the steps on the following pages.

- ➡ Before beginning, remove the prefeeder, the tooling and the disc of the feeder bowl.

Step 1—Measuring and Removing the Bowl. Measure the height between the bottom of the bowl, and the top of the spider arm (where the threaded rod connects the two parts - see Figure 5-1). Loosen and remove the bottom nut on the spider arm (on each of the eight (8) arms) and remove the bowl - pulling it up and away from the feeder.

Step 2—Replacing the Bowl. Put the new or refinished bowl in place, then set it to the correct height, ± 0.03 " (0.8 mm) as you measured in Step 1.

Step 3—Bowl Runout. Refer to the next section of this Chapter.

Step 4—Replace Disc and Check Covers. Replace the feeder disc and make sure all covers are in place before running the feeder.

How to Set Bowl Runout



Bowl runout needs to be reset if the bowl has been removed.

Adjust runout with power off and bowl drive chain disengaged.

Step 1—Gain Access. Disconnect power and air. Remove any frame covers. Lock out and tag out the feeder.

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

Step 3—Adjust Vertical Runout. Attach a dial indicator to the inside of any upper frame support. Set the indicator contact point

vertical on the rim of the bowl, up to 1/4" (6 mm) from the bowl's upper inside diameter (ID). Loosen jam nuts and locknuts above and below each arm of the bowl spider one arm at a time. Repeat as often as necessary while checking runout. Do not tighten jam nuts until Step 4.

Step 4—Adjust Horizontal Runout. Move the indicator contact point horizontal on the rim 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. Tighten locknuts and jam nuts by hand firmly but not forcibly. Inspect vertical runout and adjust again if necessary. Continue alternating between horizontal and vertical runout until both are within specification.

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

Step 6—Check Backup Ring Clearance. Ensure that proper, as-tooled gap still exists between bottom of backup ring and rim of the bowl. (Feeders for most products are tooled with approximately 1/8" gap, but for some small products the gap is less; consult your as-built documentation for specifications.) At the upper frame support, adjust the tooling ring up or down, if necessary.

Step 7—Replace Chain and Covers. Install bowl drive chain. Inspect chain tension. Replace covers and re-connect power and air.

Speed Reducer Replacement

Follow these instructions to replace the speed reducer with its direct replacement.

Step 1—Gain Access. Disconnect power and air. Remove the exit covers. Lock out and tag out the feeder to avoid any accidental starting of the feeder.

Step 2—Remove Motor. Remove mounting bolts and then remove motor from the speed reducer, leaving wiring intact. Set motor safely aside in a secure position.

Step 3—Detach the Air Regulator. Detach the air regular bracket from the reducer and disconnect the airline from the clutch. Set it aside.

Step 4—Remove Old Speed Reducer and Clutch Assembly. Remove the four (4) mounting bolts on nut plate at the bottom of the reducer mounting brackets. Slide the speed reducer/clutch assembly towards the center of the FS-30 feeder and remove the chain. Completely remove the speed reducer assembly.

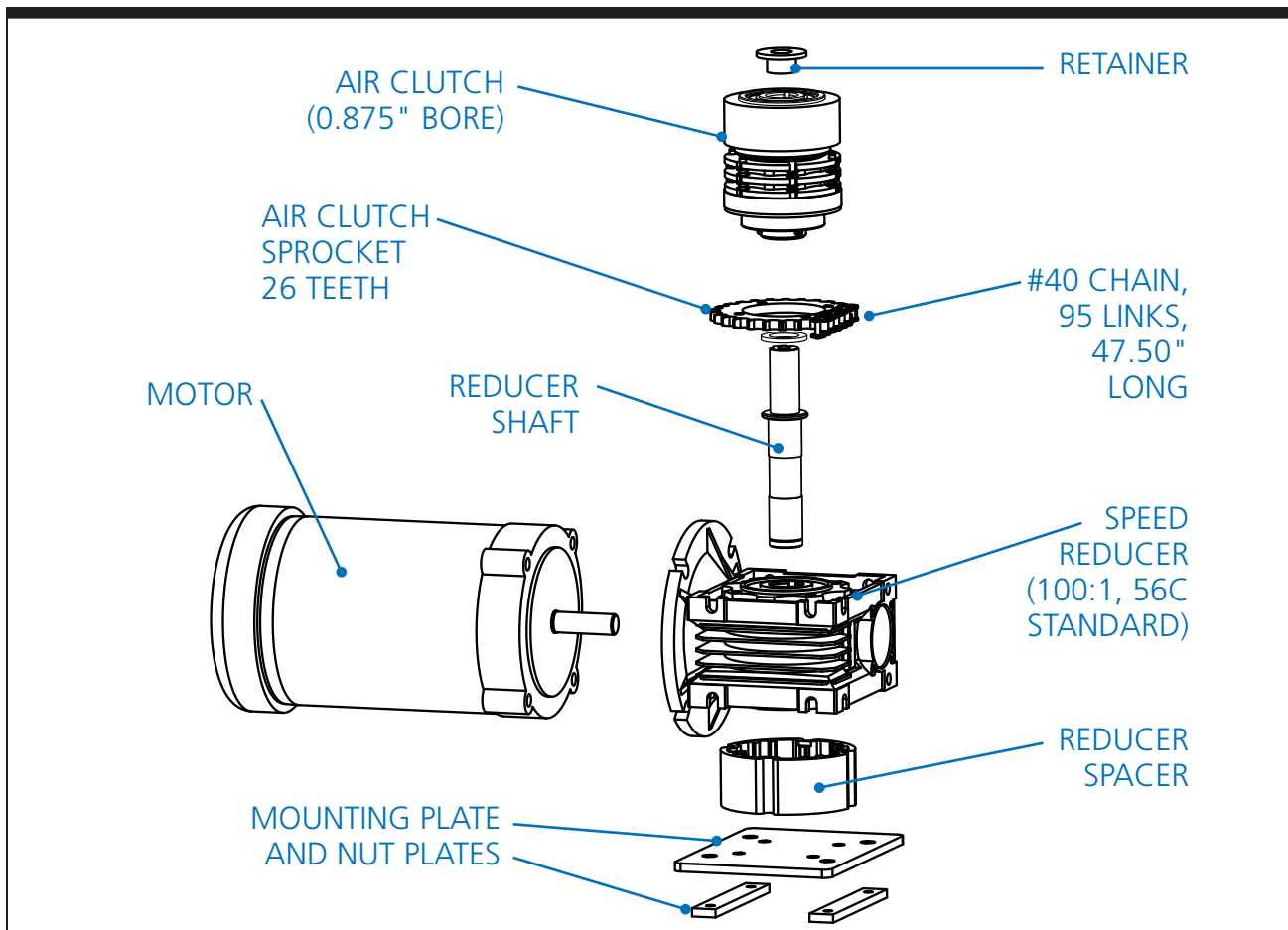


Figure 5-2. FS-30-RD Drive Assembly Exploded View

Step 5—Remove the Air Clutch Assembly. Remove the bolt located on the top of the air clutch (and sprocket) and slide the assembly up and off the reducer output shaft.

Step 6—Assembly the Output Shaft and Air Clutch Assembly. The output shaft on the speed reducer is removable and is available as a separate kit. If replacement is required, clean both contact surfaces before assembly and apply any appropriate anti-seize compound to avoid oxidation (rust) and possible seizing of the parts (refer to the manufacturer's technical information sheets that correspond with the output shaft on your equipment.) Slide the air clutch assembly down onto the reducer output shaft (see Figure 5-2) until it bottoms out against the shoulder. Tighten the setscrew.

Step 7—Install New Speed Reducer. Install new reducer assembly (the speed reducer used in the FS-30-RD is lubricated for life with synthetic lubricant and requires no filling before use) back into the feeder and reattach the two nut plates, securing the assembly to the frame. **Do not tighten the bolts yet.** Reattach the air regulator bracket and reconnect the airline to the air clutch.

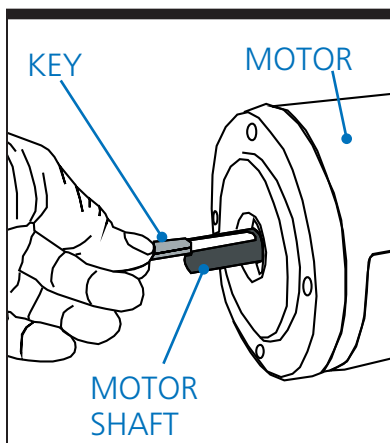


Figure 5-3. Motor Key/Shaft

Step 8—Install Motor. Install the key to the motor shaft and coat the shaft with anti-seize compound (see Figure 5-3). Insert the motor shaft into the speed reducer. Rotate the motor to the correct position and firmly secure to flange with four hex-head cap screws. Do not allow the motor to "hang" unsupported before fully seated in the reducer to avoid damaging the reducer input seal. If the motor does not readily seat itself, check to see if the key has moved.

Step 9—Adjust. Reattach drive chain and re-tension, checking sprocket alignments and wiring to insure no damage has occurred. Tighten the nut plate bolts to the frame.

Step 10—Inspect After Installation. During the speed reducer’s break-in period, it may run hotter than normal. **Nevertheless, for maximum life, do not allow the speed reducer to operate continuously above 225°F at the gear case (for AC motors used in Europe, it is customary to use 60°C maximum).** In the event of overheating, check for overloads or high ambient temperatures. Keep shafts and vent plugs clean to prevent foreign particles from entering the speed reducer. Periodically inspect all bolts to make sure they are not loose.

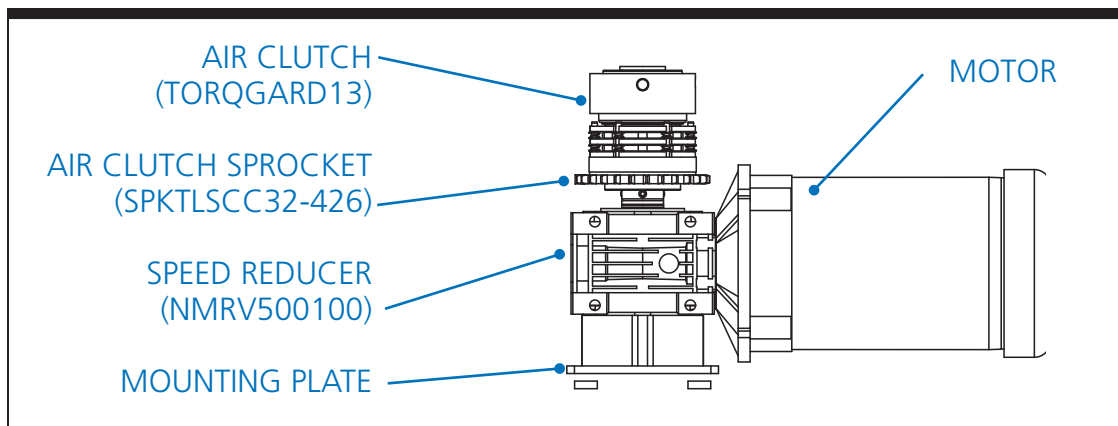


Figure 5-4. AC Motor Drive Assembly for FS-30-RD

Air Clutch Assembly Replacement

The pneumatic air clutch assembly (see Figure 5-4 above) allows the drive sprocket to slip harmlessly in the event of a product jam. Lubricants or surface corrosion on the bushings or the drive sprocket may reduce the effectiveness of the air clutch assembly. The pneumatic clutch assembly should be inspected and/or adjusted if the rim is free wheeling.

Step 1—Disconnect Power and Air. Turn off power and air and tagout/lockout the equipment for repair.

Step 2—Gain Access. Remove exit cover(s).

Step 3—Begin Air Clutch Replacement. Note the order of the components before replacing the unit (refer to Figure 5-2). Disconnect the air supply.

Step 4—Remove the Drive Chain. Remove the rim drive chain. Inspect and replace any broken or worn parts.

Step 5—Remove the Air Clutch from the Reducer. Remove the retainer at the top of the air clutch. The air clutch assembly will slide off the reducer output shaft.

Step 6—Remove the Clutch Sprocket. Remove the clutch sprocket from the air clutch assembly and install it on the new air clutch.

Step 7—Reinstall Air Clutch Assembly. Reinstall the air clutch assembly by reversing the order of removal.

Major Bearing Replacement

Major bearings in the FS-30-RD feeders are the upper and lower disc shaft spindle bearings, the upper and lower rim support spindle bearings and the disc support bearing (see Figure 5-5 and Figure 5-6 on the following pages). All major bearings except the disc shaft spindle bearings are identical.

Major Bearing Replacement Cautions:

- ➔ Eliminate other possible problems before attempting bearing replacement, as substantial disassembly of the feeder is required. Carefully note position of any tooling you remove before you begin. Keep chains clean and dry after removal.
- ➔ Most major bearings in the feeders are pre-loaded to prevent play. To prevent binding or excessive free play in the bowl, ensure that all bearing housings and the bearings themselves are clean and free of external grease, dirt, nicks or burrs prior to reassembly. If you accidentally damage critical surfaces of the housings, you may need to replace the entire spindle assembly as a unit.

- ➡ Install only 100% identical replacement bearings. In the unlikely event that the bowl will not turn, or that there is play in the bowl when you are done, you may need to replace the spindle assembly as a unit, or contact Shibuya Hoppmann Corporation for assistance.
- ➡ To maintain accuracy and prevent play in the bowl, replace both bearings of a pair at the same time. Do not replace only one.
- ➡ Do not swap housings (such as the disc shaft spindle bearing housing) from one Hoppmann feeder to another, as critical surfaces may have been custom-machined for zero play in the bowl.

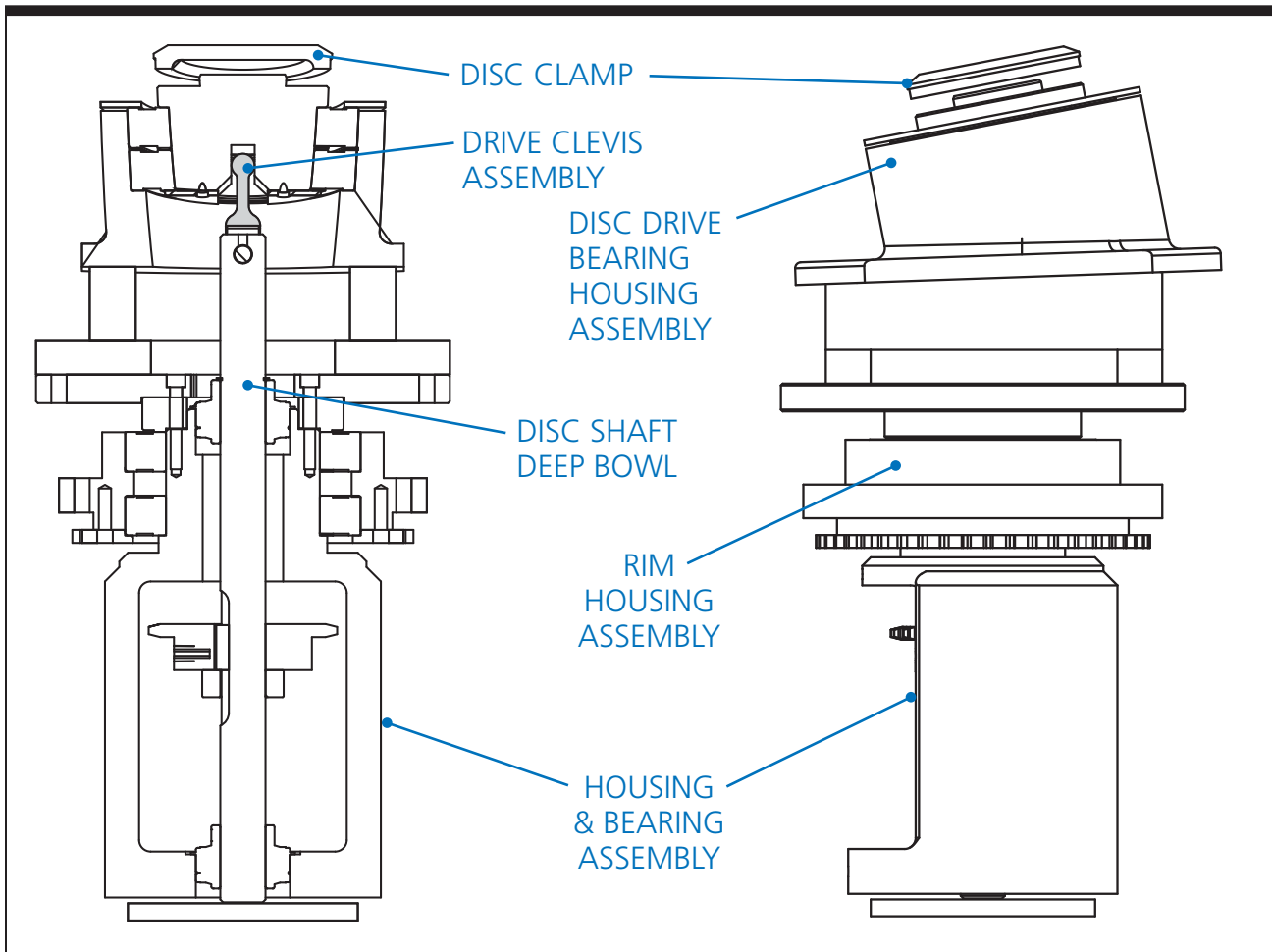


Figure 5-5. FS-30-RD Spindle Assembly

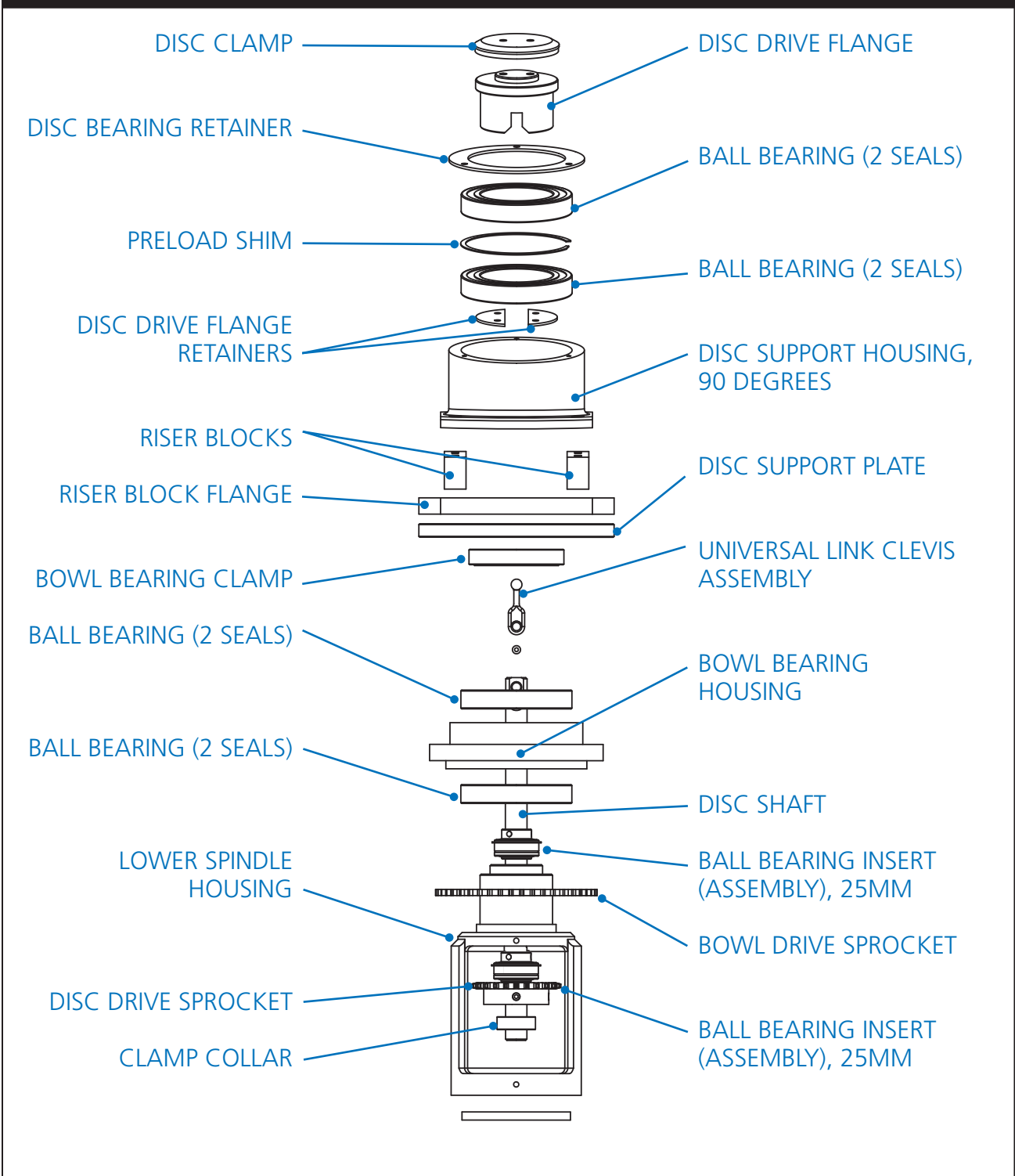


Figure 5-6. FS-30-RD Spindle Assembly Exploded View

If Product Jams: General Tips

Step 1—Inspect The Feeder. If product jams repeatedly, review the following:

- ➡ Is your prefeeder's delivery rate excessive? (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

Refer to the troubleshooting charts on the following pages which detailing common problems and possible solutions.

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 or check max level sensors downstream.
	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.
	Motor speed controller internal setting changed or defective.	Check the setting and/or replace the motor speed controller and the horsepower resistor.
RIM, BOWL AND/OR DISC JERKS WHEN MOVING.	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.
		Make sure there are sufficient parts in the prefeeder hopper.
	Air is not on to the feeder.	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

6

Replacement Parts

Replacement parts lists for the Hoppmann prefeeders 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 prefeeder 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 prefeeder'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 (1.800.368.3582)
- ➔ **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]

FS-30-RD Single Drive Centrifugal Feeder		
Part Number	Description	Qty.
NMRV500100	Speed Reducer, 100:1, 56C	1*
MOTRP.33HP	1/3hp DC Motor, 90VDC	1*
MOTRAC0033-M	1/3hp AC Motor, 208-230/460, 56C (Standard)	1*
MOTRAC0033	1/3hp AC Motor, 208-230/460, 56C (Alternative)	1*
CHANCS4076	#40 Disc Drive Chain, 76 Links, 37.50" Long	1
CHANCS4089	#40 Bowl Drive Chain, 89 Links, 44.5" Long	1
CHANC4095	#40 Air Clutch Drive Chain, 95 Links, 47.5" Long	1
BRNGASSY01	Bearing Insert, 25mm Cylindrical	2
BRNGBALL07	Ball Bearing, Double Seal	4
TORQGARD13	Air Clutch, LSCC32 x 7/8" (No Sprocket)	1
SPKTLSCC32-426	Sprocket, Air Clutch, #40, 26 Teeth	1
FS300Z1001	Idler Sprocket Assembly Weldment	1
FS200M0500	Tensioner Sprocket Assembly	1
FT30000600	Bowl Drive Sprocket, 45 Teeth	1
SPKT402425	Disc Drive Spindle Sprocket, 24 Teeth	1
FS30QCBOWL	FS30 Deep Bowl with Quick Change Slots	1
MOLDVAC006	FS30 Oversized Disc	1
MOLDVAC011	Cover, Center Cap	1

* Critical Spares Noted

****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.**

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 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.

THIS WARRANTY IS IN LIEU OF OTHER WARRANTIES, EXPRESS OR IMPLIED. ALL IMPLIED WARRANTIES, INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, ARE HEREBY EXCLUDED.

Shibuya Hoppmann™

Shibuya Hoppmann offers a wide selection of products:

- ➔ Prefeeder/Centrifugal Parts
- ➔ Feeders/Unscramblers
- ➔ Filler/Plugger/Capper Systems (CIP/SIP)
- ➔ Pharmaceutical/Beverage Filling Systems for:
 - Liquid
 - 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
- ➔ I.V. Bag Form/Fill/Seal Systems
- ➔ Pouch Fill/Cap/Seal Systems
- ➔ Collating Systems
- ➔ Puck Feed/Loading and Unloading Systems
- ➔ Syringe Filling/Assembly Systems
- ➔ Electron Beam Aseptic Filling Systems
- ➔ Line Integration/Validation Services
- ➔ PMMI Certified Training

Headquarters

7849 Coppermine Drive
Manassas, VA
20109
540.829.2564 t
800.368.3582 t
540.829.1726 f

Sales

1445 Brookville Way
Suite F
Indianapolis, IN 46239
317.322.0754 t
800.368.3582 t
317.322.0794 f

Manufacturing

291 Dillard Road
Madison Heights, VA
24572
434.929.4746 t
800.368.3582 t
434.929.4959 f

