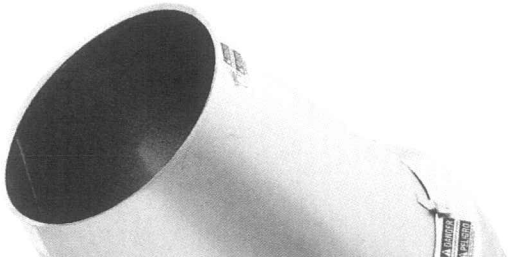
Instruction Manual

MODEL 30

SAFETY

GENERAL INFORMATION

INSTALLATION



1827 SEP 02 (s.s. JUL 02)
Model 30 addendum to
Instruction manual 1780 OCT 01

The following revisions apply to this manual:

Page 16 — **Feed Hoppers -** Add the following Feed Hoppers:
39308 - Feed Hopper, large, 33.5" (850.9 mm), rigid-tex
39349 - Feed Hopper, extra large, 37.5" (952.5 mm), for products such as baby carrots

Page 17 — **Capacities -** Statement should now read: Capacities on fresh straight green beans have run as high as **1000** pounds per hour.

Page 27 — **Feeding Method -** Add statement: Feed hopper extensions are available for every hopper in order to help feed product and obtain a quality cut. See page 53 in manual.

Page 40 — "NOTE" at end of page pertaining to amplifier exchange program is now deleted. New information for **63737 Amplfier Warranty**: Effective July 1, 2002, Urschel Laboratories no longer offers an exchange program for the 63737 amplifiers. Beginning July 1, 2002, there will be a warranty on the amplifier of two years from the date the unit is shipped to the customer. Failed warranty units need to be returned to Urschel Laboratories to receive a replacement.

Page 53 — **Covers, Guards and Hoppers:**

Page 62–65 The attached pages A4–A7 replace the existing **Electrical Assembly** pages.

Page 68 & 69 The attached page A8 replaces the existing **Electrical Schematic** pages.

Page 71 Add the following to **Safety Signs and Machine Labels** page:

	①	②	③	④	⑤
THAI (Th)	11946	11947	11949	11950	11951

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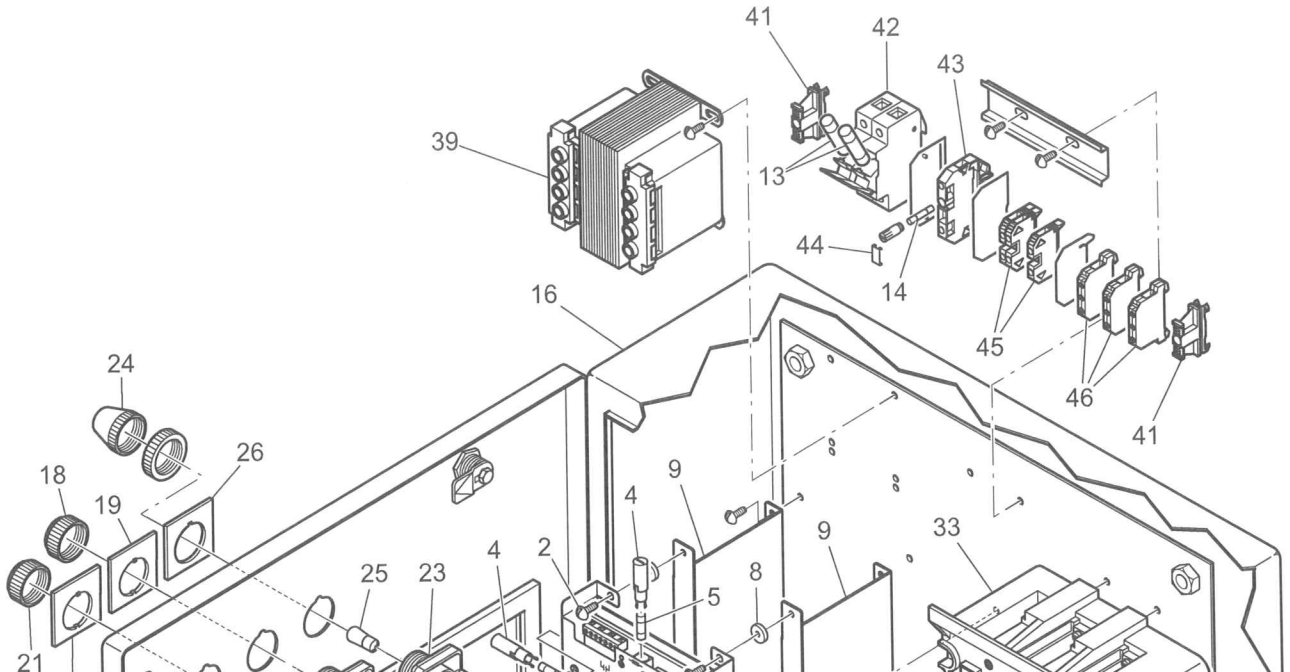
PARTS

Electrical Assembly (NEMA)



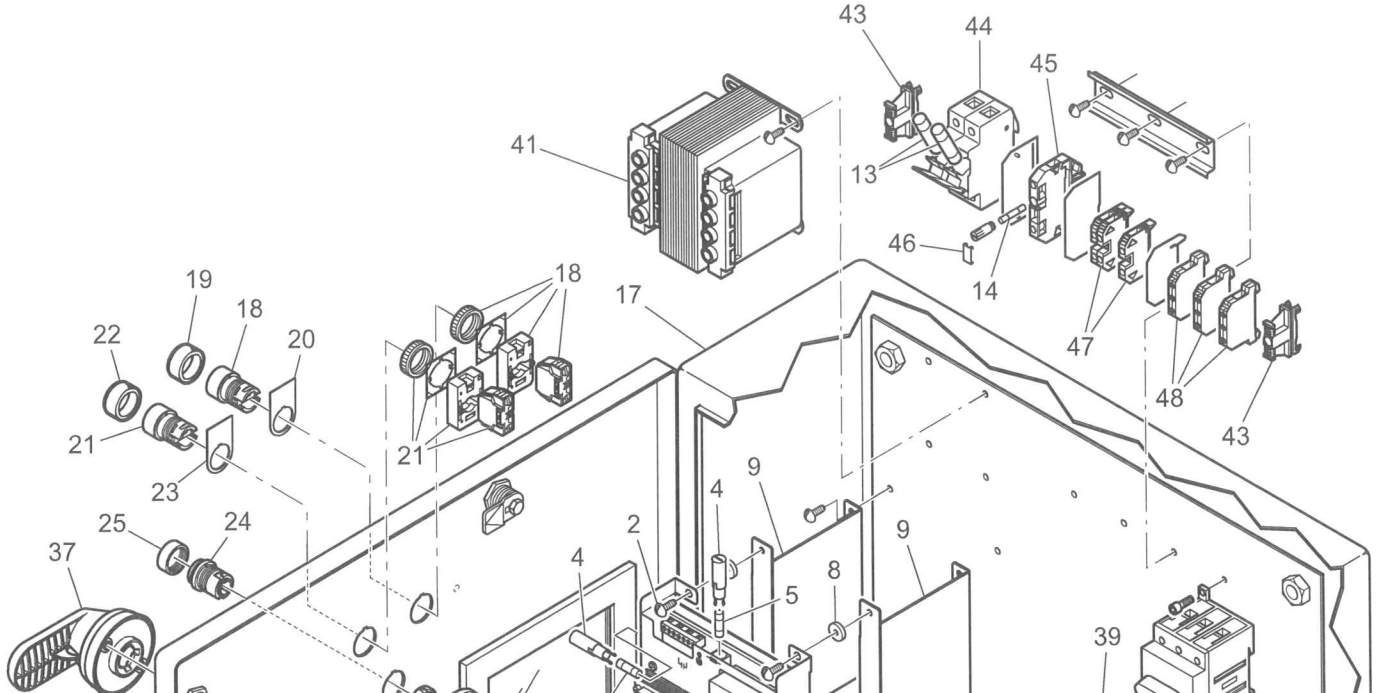
PARTS

Electrical Assembly (NEMA)

ITEM NO.	PART NO.	DESCRIPTION	QTY.
—	39369	**Electrical Assembly,** *shaker, 200-240/460 volt, (includes items 1–15)*	1
—	39370	**Electrical Assembly,** *shaker, 575 volt, (includes items 1-15)*	1
—	39371	**Electrical Assembly,** *w/o shaker, 200-240/460 volt, (includes items 1–15)*	1
—	39372	**Electrical Assembly,** *w/o shaker, 575 volt, (includes items 1-15)*	1
1	13408	**Padlock,** *with chain*	1
2	10625	**Round Head Machine Screw,** *w/washer, 10-32 x 1/2"*	4
3	63737	**Amplifier,** *(includes items 4–7)*	1
4	13673	**Adapter,** *fuse*	2
5	13671	**Fuse,** *.630 amp.*	1
6	13672	**Fuse,** *.125 amp.*	1
7	63755	**Resistor,** *22 kOhm, (for machines without shaker, quantity is 10)*	8
8	12633	**Rubber Washer,** *3/16 x 5/8 x 1/8" thick*	4
9	*	**Amplifier Bracket**	2
10	17525	**Wiring Diagram**	1
11	11593	**Breather/Drain,** *1/4"*	1
12	**	**Fuse,** *FU1, (class J)*	3
13	**	**Fuse,** *FU2, (primary)*	2
	12691	**Fuse,** *FU2, (primary), .60 amp, (575 volt only)*	2
14	21285	**Fuse,** *FU3, (secondary), 1.0 amp., (all voltages)*	1
15	**	**Heater Element**	3
16	23215	**Combination Starter,** *size "1", (includes items 17–46)*	1
17	13449	**Push Button,** *start (includes item 18)*	1
18	60218	**Rubber Boot,** *start*	1
19	12605	**Legend Plate,** *I for start*	1
20	13450	**Push Button,** *stop (includes item 21)*	1
21	60219	**Rubber Boot,** *stop*	1
22	12606	**Legend Plate,** *O for stop*	1
23	12597	**Pilot Light,** *(includes items 24 & 25)*	1

PARTS

Electrical Assembly (CE Compliant)



PARTS

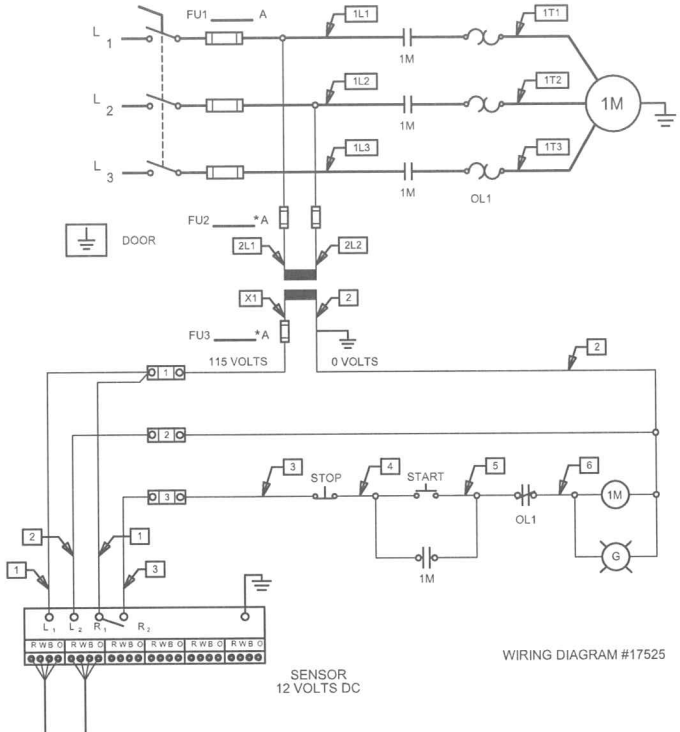
Electrical Assembly (CE Compliant)

ITEM NO.	PART NO.	DESCRIPTION	QTY.
—	39366	**Electrical Assembly,** *shaker, IEC, 380-415 volt, (includes items 1–16)*	1
—	39367	**Electrical Assembly,** *w/o shaker, IEC, 380-415 volt, (includes items 1–16)*	1
1	13408	**Padlock,** *with chain.*	1
2	10625	**Round Head Machine Screw,** *w/washer, 10-32 x 1/2"*	4
3	63737	**Amplifier,** *(includes items 4–7)*	1
4	13673	**Adapter,** *fuse*	2
5	13671	**Fuse,** *.630 amp.*	1
6	13672	**Fuse,** *.125 amp.*	1
7	63755	**Resistor,** *22 kOhm, (for machine without shaker, quantity is 10)*	8
8	12633	**Rubber Washer,** *3/16 x 5/8 x 1/8" thick*	4
9	*	**Amplifier Bracket**	2
10	39368	**Wiring Diagram**	1
11	11593	**Breather/Drain,** *1/4"*	1
12	**	**Fuse,** *FU1, (class J)*	3
13	12924	**Fuse,** *FU2, (primary), .50 amp*	2
14	12923	**Fuse,** *FU3, (secondary), .50 amp*	1
15	**	**Overload Relay,** *(use with item 35 Overload Base Adapter)*	1
16	12871	**Transparent Cover For Adjustment Dial**	1
17	23203	**Combination Starter,** *IEC, 22A (includes items 18–48)*	1
18	12975	**Start Button Assembly,** *(includes item 19)*	1
19	12977	**Protective Cap,** *flush head, IEC*	1
20	12978	**Name Plate,** *(I) start, IEC*	1
21	12976	**Stop Button Assembly,** *(includes item 22)*	1
22	12977	**Protective Cap,** *extended head, IEC*	1
23	12979	**Name Plate,** *(O) stop , IEC*	1
24	12757	**Pilot Light,** *IEC, (includes items 25 & 26)*	1
25	12758	**Pilot Light Lens,** *IEC*	1
26	12599	**Bulb,** *pilot light, IEC*	1

PARTS

Electrical Schematics

NEMA



WIRING DIAGRAM #17525

Use with 17525 schematic.

LOCATION	VOLTAGE	FUSE (FU2) PART NO.	AMPS
N. AMERICA	208 - 230	12697	1.50
	460	12692	.8
OUTSIDE N. AMERICA	200 - 208	12994	2.00
	220 - 240	12929	1.00

Use with 17525 & 39368 schematics.

MOTOR FULL LOAD AMPS	HEATERS		FUSE (FU1) CLASS J (AJT) FUSE	AMPS
1.60 - 1.75	W33	12640	12784	2
1.76 - 1.93	W34	12680	12785	3
1.94 - 2.12	W35	12641	12785	3
2.13 - 2.33	W36	12642	12785	3
2.34 - 2.56	W37	12643	12786	3
2.57 - 2.81	W38	12580	12786	4
2.82 - 3.09	W39	12581	12786	4
3.10 - 3.40	W40	12582	12786	4
3.41 - 3.74	W41	12583	12787	5
3.75 - 4.11	W42	12584	12787	5
4.12 - 4.52	W43	12585	12788	6
4.53 - 4.97	W44	12586	12788	6
4.98 - 5.46	W45	12587		
5.47 - 6.01	W46	12588	12789	8
6.02 - 6.60	W47	12589	12789	8

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MODEL 30
Instruction Manual

1780 OCT 01
(supersedes 1117 JUL 83)

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FOREWORD

This manual must be read by or to each person before that person operates, cleans, repairs, adjusts, installs, supervises the operation of, or uses this machine in any way.

You must learn and follow all the safety rules and operating principles set forth in this manual. This means:

1. Follow all warnings, cautions, and other safety messages in this manual and on the machine. Recognize the safety alert symbol ⚠ , which indicates a potential personal safety hazard.
2. Never work beyond defined safety skills.
3. Insist on thorough and proper safety training.
4. Notify your supervisor of any machine condition which may create a hazard in its operation.
5. Notify Urschel Laboratories immediately of any accidents that have occurred on this machine.

If there are any questions regarding the safe operation of this machine, contact Urschel Laboratories.

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contents

SAFETY

⚠**WARNING:** ***Any person who operates, cleans, repairs, adjusts, installs or supervises the operation of or uses this machine in any way must know and follow all safety rules and operating***

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READ AND PRACTICE SAFETY RULES IN THIS MANUAL:

1. DANGER! This machine contains sharp knives and rotating parts. Never operate this machine if any guard or safety device has been opened, removed, or modified; doing so can result in serious injury or amputation.

2. When covers or guards are opened or removed, sharp edges and pinch points are exposed. Use extreme caution to avoid touching or striking these areas with your hands or body.

3. Always **disconnect and lock out the power source,** push the "I" (START) button and verify machine does not start before doing any work on this machine.

4. DANGER! Never put your hand or any foreign object into the feed opening or discharge area. Serious personal injury and/or damage to the machine may result.

SAFETY

Safety Signs

Safety signs and safety switches are placed on Urschel® machines to help you avoid personal injury. ***They are there for your protection.*** *If your machine does not have these signs or switches, you must not operate the machine. Notify your supervisor and contact Urschel Laboratories, Inc. For the part numbers, languages and locations of safety signs, see "Safety Signs and Machine Labels" in the parts section of this manual.*

Figure 1 — Caution label

⚠ **A caution label** (Figure 1) is provided to remind you of safety rules which must be followed to avoid personal injury.

Figure 4 — Danger label, removed guard

⚠ **Danger labels** (Figure 4) are visible when a protective cover or guard has been opened or removed. This label warns you that the machine is unguarded and must not be restarted until all covers and guards are replaced.

⚠ **A danger label and a hazard alert label** (Figure 5) are placed on the starter enclosure to warn you that this is a source of electrical hazard. The enclosure must be opened and serviced

SAFETY

Protective Devices

⚠ **Safety switches** (Figure 6) are provided to prevent operation of the machine when certain protective covers or guards have been opened or removed. These switches must be checked before operating the machine and repaired or replaced if they do not work properly. Never rely solely on these safety switches. Always push the "**O**" (STOP) button then **disconnect and lock out the power source** before removing any part from the machine.

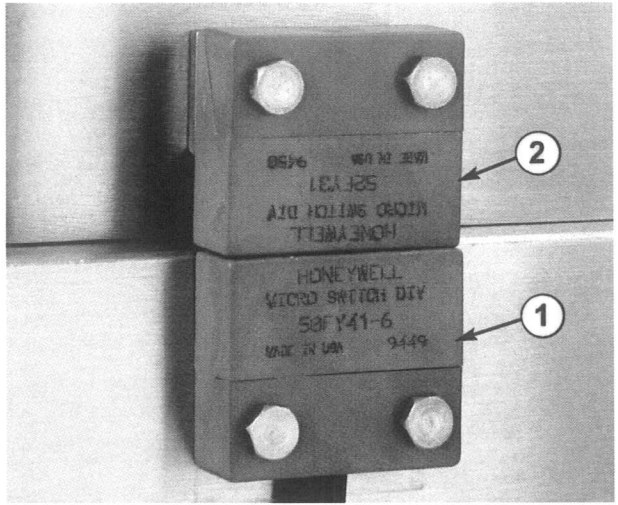
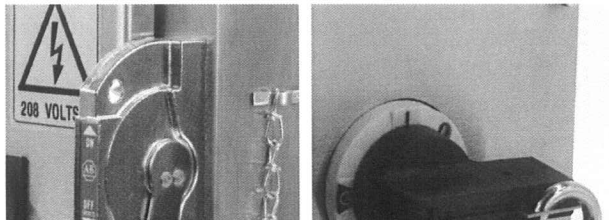


Figure 6 — Safety switch. (1) Sensor, (2) Actuator

⚠ **Power disconnect/lockout switch** (Figure 7), located on the starter enclosure, will eliminate the danger of accidental start-up when locked in the "**O**" (OFF) position.



SAFETY SWITCH SYSTEM

The safety switch system has an amplifier which utilizes prewired safety switches on certain covers and guards to prevent the machine from operating when these covers or guards are opened or removed.

⚠ **WARNING:** ***A qualified trained person must check the safety switch system for proper function before operating the machine. There is a problem with the safety switch system if the machine can be started while any cover or guard that is equipped with a safety switch is opened or removed. DO NOT operate the machine in this condition! Serious injury such as amputation could result!***

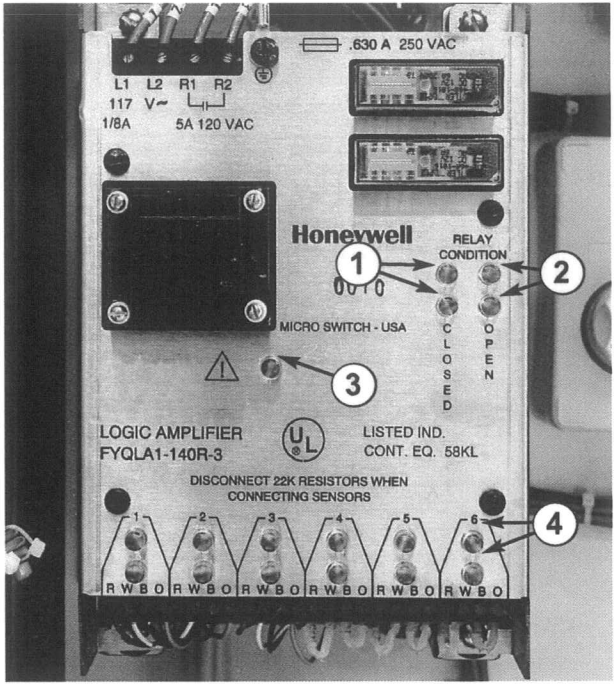


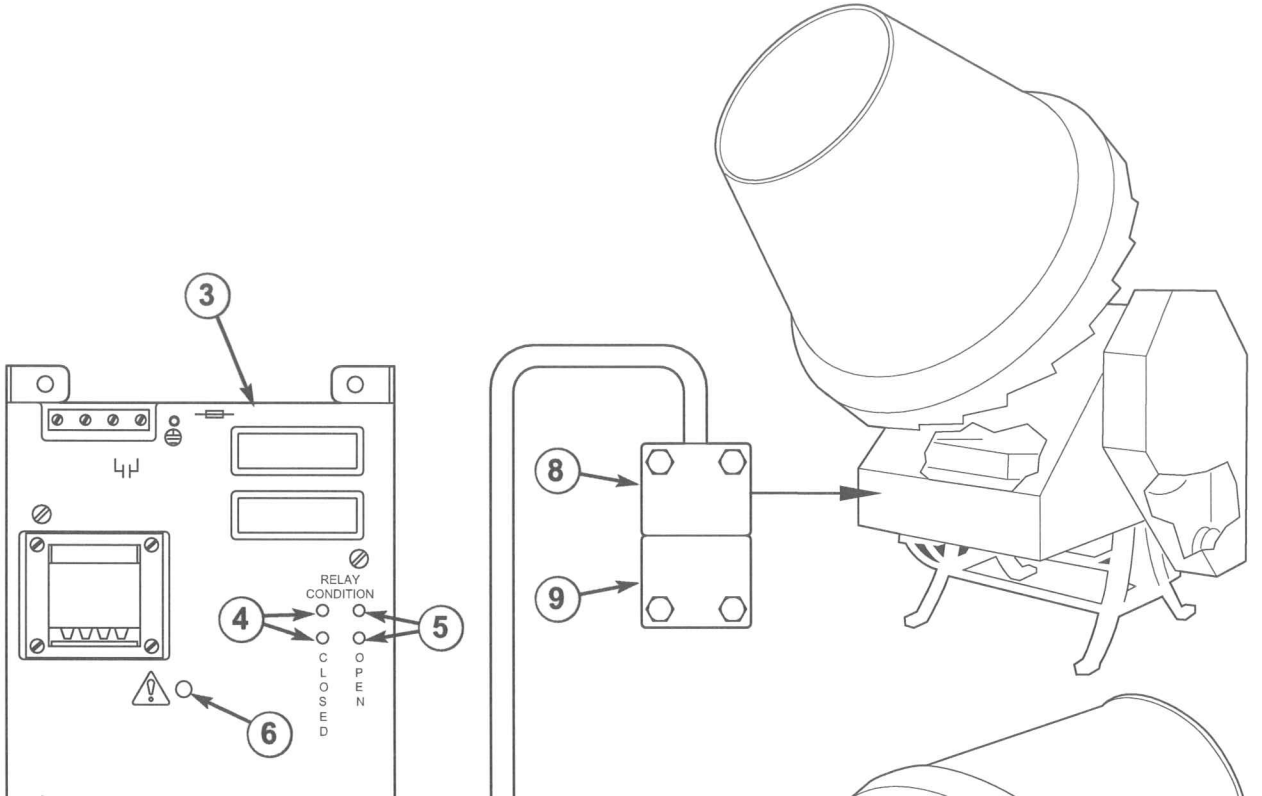
Figure 8 — Amplifier. (1) Green "Relay Condition" LEDs, (2) Red "Relay Condition" LEDs, (3) Red "Attention" LED, (4) Red "Switch Output" LEDs

SAFETY SWITCH

SAFETY SWITCH SYSTEM TEST

⚠ WARNING: ***A qualified trained person must check the safety switch system for proper function before operating the machine. There is a problem in the safety switch circuit if the LEDs are not lit as indicated or, if having opened or removed a cover or guard equipped with a switch, the machine can be started. DO NOT operate the machine in this condition! Operating the machine in this condition could result in serious injury such as amputation! Call a qualified electrician to locate and repair the fault. See "Electrical Assembly", page 38.***

1. **With all covers and guards in place,** turn the power disconnect/lockout switch to "**I**" (ON). Only the green "relay condition" LEDs on the amplifier should
2. **Remove or open one cover or guard equipped with switch.** Turn power disconnect/lockout switch to "**I**" (ON). Only the red "relay condition" LEDs and the red "switch output" LEDs corresponding to the switch on the removed or opened cover or guard should be lit on the amplifier. If LEDs are lit correctly, push the "**I**" (START) button. The safety switch circuit has been interrupted and machine should NOT start. If the machine does start, that safety circuit has failed. Push the "**O**" (STOP) button, then **disconnect and lock out power source.** Call a qualified electrician to locate and repair the fault immediately.
3. **Turn the power disconnect/lockout switch to "O" (OFF)** and replace or close the cover or guard.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RELAY CONDITION
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CLOSED
OPEN
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GENERAL INFORMATION

GENERAL INFORMATION

Specifications

SPECIFICATIONS

The main frame, inside and outside cutting units are of high quality, gray iron castings and manganese aluminum bronze.

The main drive unit is an enclosed double worm gear bathed in oil.

The main bearings are of high speed babbitt with pressure lubrication.

The shaker has frame work of stainless steel with a screen of perforated stainless steel.

⚠ **WARNING:** ***Do not modify this machine! Any modification or omission of parts could compromise the safety and sanitation of this machine!***

Length:.....58.10" (1476 mm)
Width:.....40.02" (1016 mm)
Height: .....63.95" (1624 mm)
(See "Dimensional Drawing," page 72)

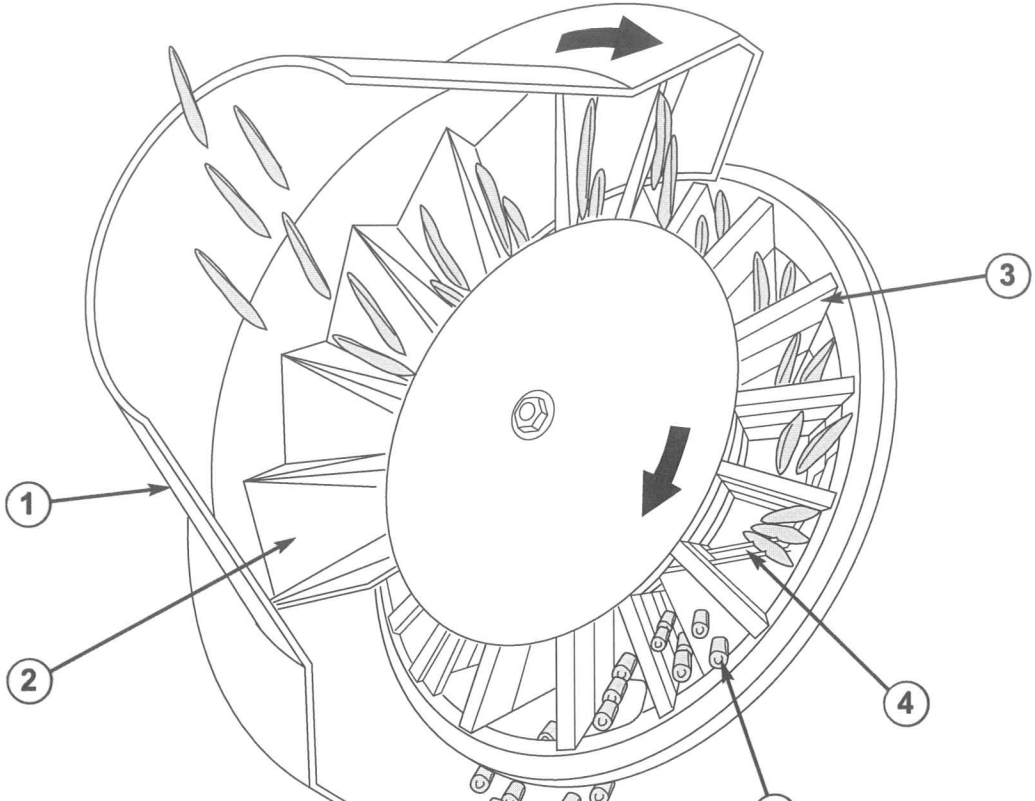
NOISE EMISSION

The amount of noise generated by this machine in use will vary depending on the type, condition and volume of product being cut, the size of cut, the operating speed, the distance the machine is positioned from the floor and the acoustical characteristics of the room in which the machine is installed.

KNIVES

Knives are of stainless steel to prevent discoloration of cut ends when product enters the machine in a wet condition.

Each knife is held in position by a spring. If a nail or other foreign material should enter the machine, the knives will release and thus prevent damage being done to the machine or the knives.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INSTALLATION

INSTALLATION

Shipment, Pre-installation, Location

MACHINE SHIPMENT

Every Urschel machine is fully inspected and test-run before it is shipped. The Model 30 is shipped completely assembled. The feed hopper is removed for shipment and packed in a separate crate and shipped with the machine. Spare parts and required tools are packed in separate boxes and shipped in the crate with the machine. Check the exterior of the machine for damage. Visually check the inside bowl area for objects which may have entered the machine during shipping.

PRE-INSTALLATION PLAN

Before installation, prepare a plan to make the use of this machine safe and efficient. This plan should consider location, electrical power source and method of feeding

LOCATION

Choose a location that provides machine stability, ample space, and a clear path on all sides of the machine so that operators can move safely and easily in a clean, dry work area. Provide easy access to the controls on the starter enclosure and also allow room for cleaning and maintenance. The location should provide level footing, adequate lighting and ventilation and provisions for excessive noise levels. Never locate machine in an area with a potentially explosive atmosphere.

Urschel Laboratories recommends that this machine be installed on a stable support allowing the machine to be accessible at floor level. If elevating the machine is unavoidable, all operation, cleaning, maintenance and safety features of floor level accessibility must be maintained.

LIFTING THE MACHINE

⚠ WARNING: ***Secure machine frame to lifting forks with a chain or strap to prevent tipping. If the machine tips and falls from lifting forks, bodily injury from crushing and damage to the machine may result.***

⚠ CAUTION: ***Always use the frame to lift or move the machine, never the starter enclosure, motor, covers or guards. Do not crush electrical cords beneath frame when lifting machine!***

Both sides of machine frame should rest on lifting forks. (Figure 11).

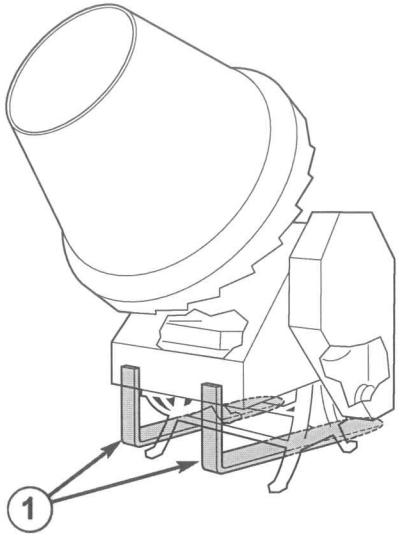


Figure 11 — Always use frame to lift or move machine.
(1) Lifting Forks

INSTALLATION
Electrical Power

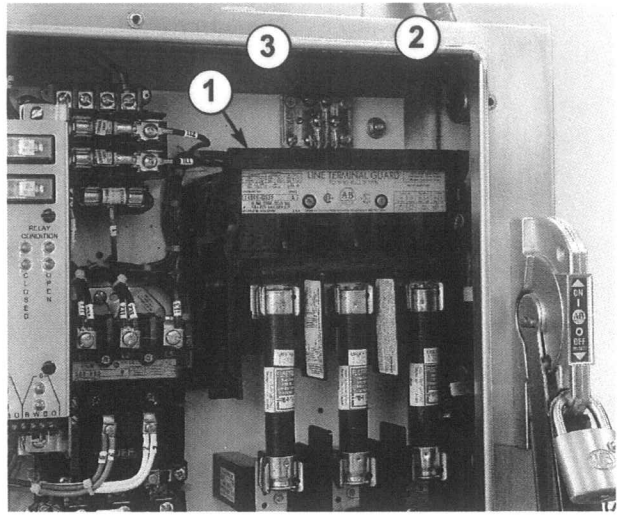
ELECTRICAL POWER

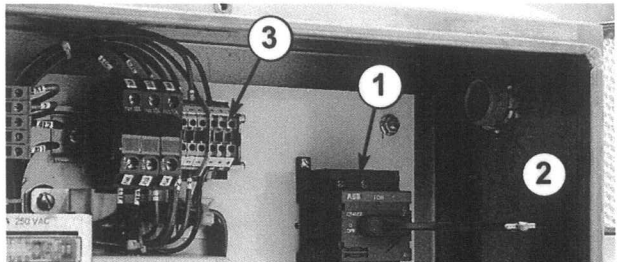
To insure the machine is properly wired, the electrical installation must be performed by a *qualified electrician* in accordance with all applicable electrical codes. Refer to Figure 12 and proceed as follows:

1. **Connect the outside power source** to the terminals on top of the disconnect in the starter enclosure. The hazard alert label on the front of the starter enclosure specifies proper voltage for this machine.

   NOTE: *If voltage is not at least 95% of specified voltage, the motor may become overloaded during operation.*

   To maintain the watertight feature of the starter enclosure, use "liquid tight" or rigid conduit and appropriate fittings at the power source entry point on the side





2. **Connect grounding conductor (green or green and yellow striped wire)** to the earthing bar located on back panel inside the starter enclosure.

⚠ WARNING: ***This machine can be electrified with voltages dangerous to life if not properly grounded! Always maintain an earth ground to the earth termination point on this machine.***

3. **Connect the wiring** so that the feed hopper and inside bowl turn clockwise (Figure 13).

4. **Securely tighten screws** on the starter enclosure door when finished with installation.

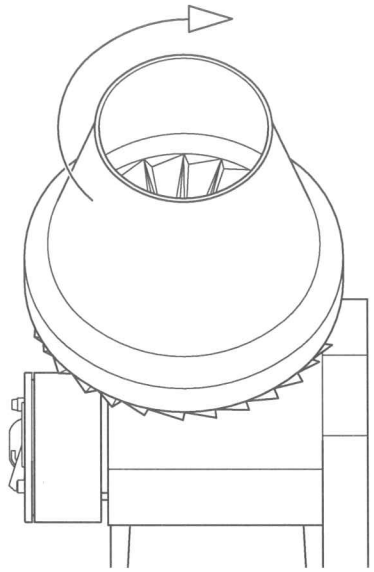


Figure 13 — Top view; connect wiring so that the feed hopper and inside bowl turn clockwise.

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OPERATION

⚠**WARNING:** ***This machine contains sharp knives and rotating parts. Only qualified trained personnel should***

OPERATION

Start-up, Stopping and Feeding

START-UP PROCEDURE

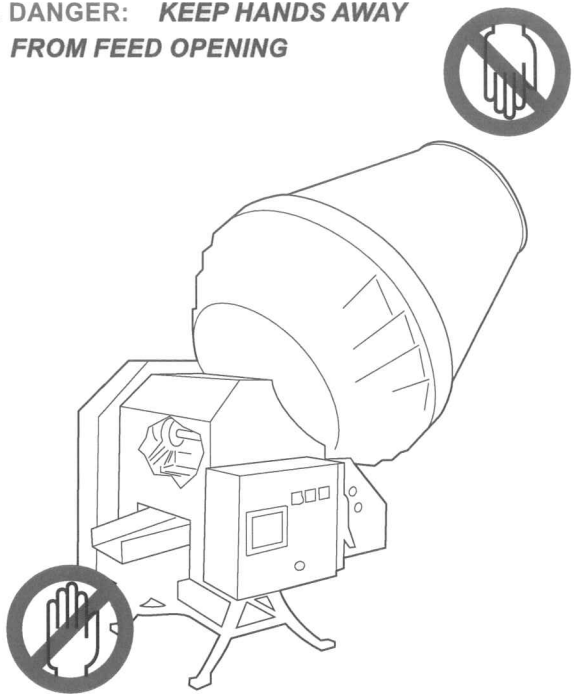
⚠ CAUTION: ***Processing food products can create hazardous floor conditions. Provisions must be made to help prevent the operator from slipping while moving around the machine.***

1. **All operators must have a thorough understanding of the safe operation** of this machine (Figure 14). See "Foreword" on page 2 and "Safety" starting on page 7.

2. **The safety switch system must be tested** and in working order. All covers and guards must be securely in place. See "Safety Switch System Test", page 12.

⚠ WARNING: ***A qualified trained person must check the safety switch***

⚠ DANGER: ***KEEP HANDS AWAY FROM FEED OPENING***



⚠ DANGER: ***KEEP HANDS AWAY FROM DISCHARGE OPENING***

STOPPING PROCEDURE

⚠ WARNING: ***Never attempt to open or remove covers or guards while machine is running! Contact with exposed rotating parts may cause severe injury such as amputation!***

1. **Stop feeding product.** This allows remaining product to be cut and discharged.

2. **Flush the inside bowl area thoroughly** with a generous amount of water BEFORE stopping the machine. See pages 32–33 for complete cleaning procedures.

3. **Push the "O" (STOP) button then disconnect and lock out power source.** After machine has come to a complete stop, push the "I" (START) button to verify

FEEDING METHOD

⚠ CAUTION: ***Do not allow foreign material such as tools, hardware, stones, wood, bottles or cans to enter the feed area. The cutting parts will be damaged or destroyed and the product contaminated.***

The feeding method affects the quality and capacity of the finished product. A *steady, uniform flow of properly sized product* from a conveyor or similar feeding system yields the best quality and greatest capacity. Dumping large quantities of product into the feed hopper will produce undesirable cuts and can overload the motor, clog the inside bowl or jam the cutting unit. Continuous overfeeding or jamming will also cause premature damage and failure of machine components.

Except for an emergency, never start or

OPERATION

Speed Control & Machine Overload or Jam

SPEED CONTROL

The pulley speed of the Model 30 cutter is 300 revolutions per minute. The feed hopper must turn in a clockwise direction at 25 revolutions per minute. It must not under any conditions rotate faster than this or the beans will not feed properly into the cutting chamber. With the 39103 special feed hopper for asparagus, the machine will probably work best with the feed hopper rotating at about 22 revolutions per minute.

⚠ WARNING: ***Do not operate at higher than recommended speeds. To do so could create a safety hazard and cause excessive wear on machine parts!***

MOTOR OVERLOAD

If the motor shuts off during operation, it is likely that it has been overloaded. After maintenance personnel have corrected the problem (allowing at least five minutes for thermal overloads to cool) machine may be restarted by first pressing the "RESET" button on the starter enclosure then starting in the normal manner. If motor again shuts off, see "Troubleshooting", page 42.

CORRECTING MACHINE OVERLOAD OR JAM

MAINTENANCE

⚠**WARNING:** ***This machine contains sharp knives, rotating parts, and voltages dangerous to life. Only qualified***

MAINTENANCE

Covers and Guards

OPENING OR REMOVING

⚠ **WARNING:** ***Before opening or removing any cover or guard always turn the power disconnect/ lockout switch to "O" (OFF) and lock out power source. After machine has come to a complete stop, press the "I" (START) button to verify machine will not start. Do not attempt to operate this machine if any cover or guard is opened or removed. Operating the machine with covers or guards opened or removed may result in serious injury such as amputation!***

Open or remove the following covers and guards to service the various areas of the machine (Figure 16, page 31).

Feed Hopper and Hopper Extension: Remove to service or replace inner bowl.

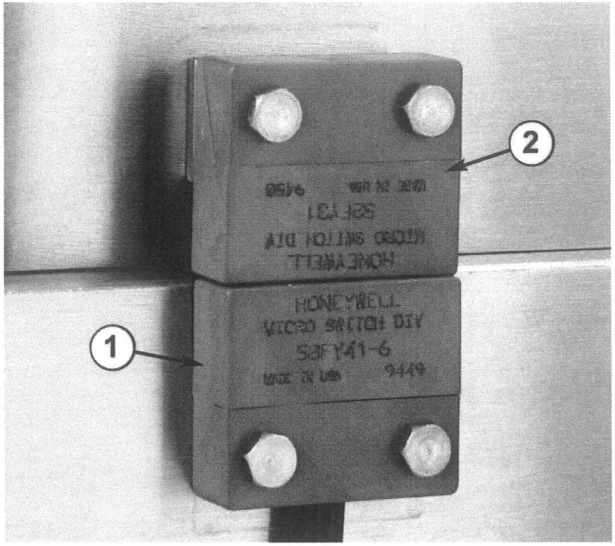
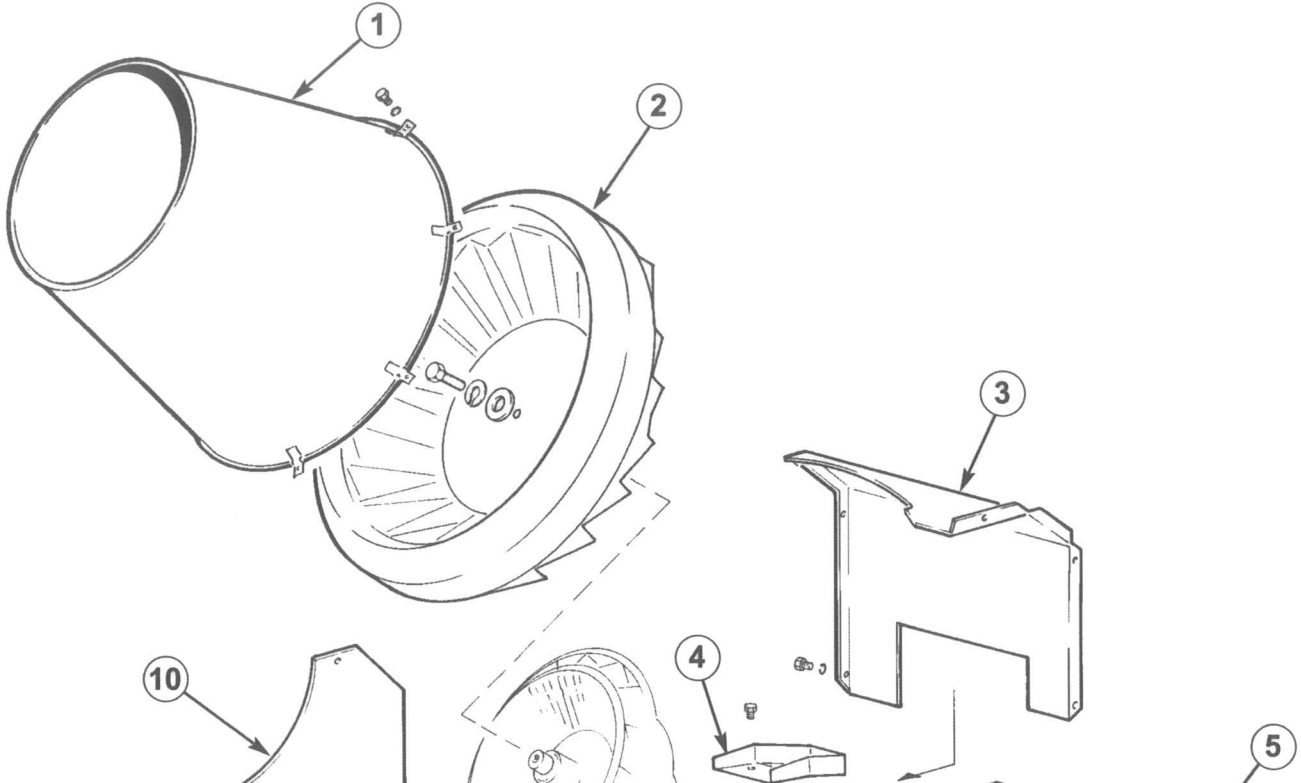


Figure 15 — Safety switch sensors and actuators must be aligned and within 1/16" (1.6 mm).
(1) Sensor, (2) Actuator

INSPECTION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MAINTENANCE
Cleaning

IMPORTANCE OF DAILY CLEANING

Stainless steel and manganese aluminum bronze parts will corrode if salty and acidic product juices are not removed completely. Also, product that remains in the cutting unit may harden making future cleaning difficult and encouraging bacterial growth. Heavy product build-up on cutting parts can reduce cutting efficiency and cause the loss of critical tolerances and clearances.

CLEANING AGENTS

The selection of cleaning agents or their solution strength will depend on the application or process in which the machine is involved. Consult your cleaning materials supplier for selecting and using the proper cleaning agent to meet the sanitizing requirements for your process. Cleaning

DAILY CLEANING PROCEDURES

Only qualified trained personnel should clean the machine. Consult your company policy regarding proper cleaning/sanitizing solutions and required frequency of cleaning.

NOTE: *Never use abrasives, metal tools, wire brushes or sandpaper to clean any parts. Scrape with wooden or plastic tools if necessary.*

1. **Clean outside of machine with water.**

NOTE: *Do not direct a stream of water at the starter enclosure or electrical connections. Water entering the starter enclosure could cause electrical failure and void the warranty.*

2. **Flush product from cutting parts.** Direct a stream of water or cleaning

3. **Stop the machine. Turn power disconnect/lockout switch to "O" (OFF) and lock out.** After machine has come to a complete stop, press the "I" (START) button to verify machine will not start before opening or removing any cover or guard.

4. **Remove the feed hopper**, front cover and back cover. Thoroughly wash all sheet metal covers (see "Opening or Removing", page 30.)

5. **Remove and disassemble the cutting parts.** See pages 36 and 37. Thoroughly wash all cutting parts with water or appropriate cleaning solution. If cleaning solutions are used, rinse thoroughly.

6. **Clean remaining portion of machine.** A forceful stream of water will remove

SAFETY SIGNS

⚠ WARNING: ***Safety signs are placed on machines to help users avoid personal injury. If the machine does not have these signs or if they are no longer legible do not use the machine. Install or replace the signs immediately.***

INSPECTION

Safety signs: Inspect all safety signs on machine for damage. Damaged, loose, illegible or missing signs must be replaced. See "Safety Signs and Machine Labels", pages 70–71 for sign placement and part number information.

INSTALLATION

1. **Clean mounting surfaces.** Remove all traces of old sign material and adhe-

MAINTENANCE

Lubrication

RECOMMENDED LUBRICANT

Use a food grade lubricant that is non-toxic, sanitary and approved for incidental food contact. The lubricant recommended for this machine, except motor,is Haynes® Lubri-Film (listed as H-1 by the USDA) available in grease cartridges. The lubricant may be purchased from Urschel Laboratories. See "Tools", page 48.

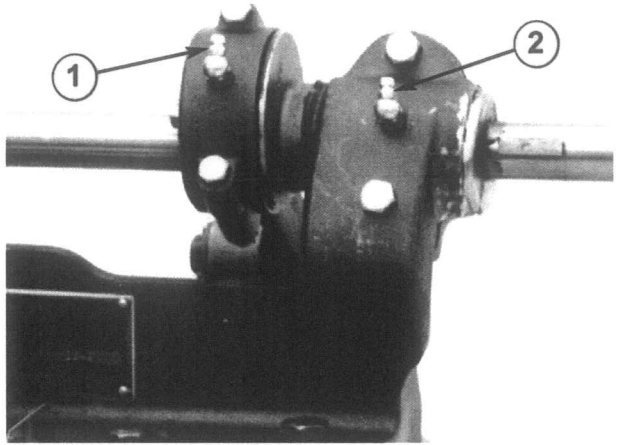
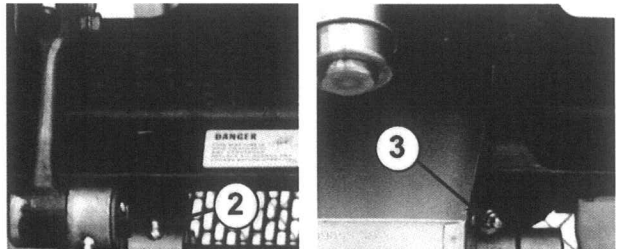


Figure 18 — Lubrication Points. (1) Eccentric Arm Assembly, (2) Main Frame Casting

LUBRICATION POINTS

The Model 30 machine has thirteen (13) lubrication points. The gear case assembly has a total of three (3) grease fittings which are located on the gear case behind the outside bowl (Figure 17). The main frame casting and eccentric arm assembly have two (2) grease fittings located on the motor side of the machine (Figure 18). The shaker



LUBRICATION SCHEDULE

Lubricate as follows:

1. **Every four hours** of operating time.

2. **After cleanup** to force cleaning solutions from bearings. Before replacing covers, lubricate until grease appears at the washers and studs in the shaker assembly.

3. **After maintenance** to replace any grease lost during these procedures.

MOTOR LUBRICATION

Lubricate according to the motor manufacturer's instructions which are supplied with this machine.

MAINTENANCE
Knife Replacement

KNIFE REPLACEMENT

⚠ WARNING: ***Always handle both new and used knives with care to avoid coming in contact with cutting edge. Even a dull knife can cause personal injury.***

Short Knives, machines with shaker assembly:

1. Disconnect and lock out the power source.
2. Remove back cover.
3. Remove knife holder bar.
4. Slip used knives out of knife slots.
5. Slip new knives into proper slots. Consult charts on pages 58–59, if necessary, for correct placement of knives for your size cut. When the knife is installed correctly, the back of the knife should butt against the knife release assembly. Adjust knife

Short Knives, machines without shaker assembly:

Proceed as above, omitting steps 2 and 7.

Long Knives, machines with shaker assembly:

1. Remove hex head cap screw, flat washer and lock washer from center of feed hopper.
2. Remove feed hopper and hopper extension in one unit.
3. Remove belt guard cover.
4. Remove front cover. (2 fasteners are located on belt guard back, 3 fasteners attach front cover to side cover panel.)
5. Remove two screws and washers holding long knife in place.
6. Carefully slip out long knife.
7. Slide new knife into place, cutting edge first

Long Knives, machines without shaker assembly:

Proceed as above, omitting steps 3, 4, 9 and 10.

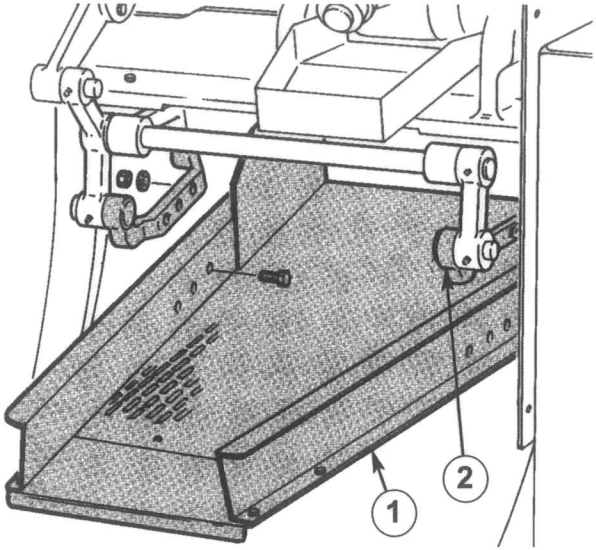
⚠ WARNING: ***Never attempt to rotate inner bowl by placing fingers over the outer edge! This places fingers in a direct line with the knives and will result in serious injury.***

INSTALLING INSERTS

1. Remove the short and long knives, following procedures outlined under "Knife Replacement", page 36.
2. When all knives have been removed, loosen set screws in hub of inside bowl one full turn each.
3. Remove key from keyway.
4. Remove inside bowl from shaft.
5. Place inserts firmly in the bottom slot of

INSTALLING SHAKER

Fit the shaker between the shaker support castings that hang below the cross frame. Line up holes, insert bolts and tighten.



MAINTENANCE
Electrical Assembly

INSPECTION

⚠ **WARNING:** ***In the event of an electrical problem, only a qualified electrician should inspect or repair the fault. Voltages dangerous to life exist in the starter enclosure! The power disconnect/ lockout switch must be in the "O" (OFF) position. Live voltages are still present in the box even though power disconnect/lockout switch is off. Always disconnect and lock out power source to starter enclosure before beginning electrical inspection or repair.***

The electrical assembly must be in good working condition before operating this machine. For a description of amplifier and safety switch operation and method for checking this system, see pages 11–13. Electrical schematics are located in the starter enclosure and on pages 68–69.

Starter enclosure: Inspect interior of starter enclosure for corrosion. If a significant amount of water accumulates in the bottom of the starter enclosure, check the breather drain. Breather drain should be free from obstruction. Excess water could also indicate an opening or loose fitting that allows water to enter the enclosure. Check all access points to the enclosure. Check gasket around door and window. Inspect **"O"** (STOP) and **"I"** (START) push button assemblies, selector switches and pilot light assembly for damage or corrosion. Replace rubber boots and pilot light lens if damaged.

NOTE: *Electrical components that fail due to water or chemical contamination are not covered under the warranty.*

Fuses (NEMA & CE enclosures): Remove main fuses and transformer fuses. Check with an ohmmeter or continuity light. If one fuse is replaced, all others of that type fuse should also be replaced.

Heaters (NEMA enclosure): If heaters (thermal overloads) have been tripped several times they may fail to reset. If one heater fails, all heaters in that starter should be replaced. Check for proper motor current draw if heaters continue to trip.

Starter coil (NEMA enclosure): Disconnect leads from coil at front of motor starter and check with an ohmmeter. Replace if necessary.

Contactor (CE enclosure): Disconnect leads from coil on top of contactor and check with an ohmmeter. Replace coil or contactor if necessary.

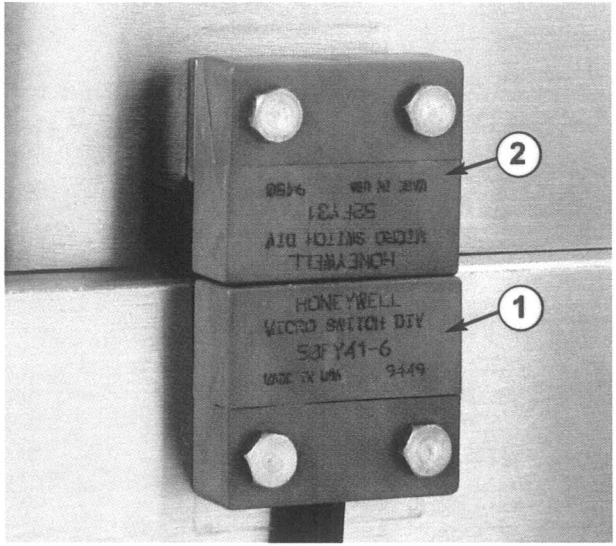


Figure 26 — Safety switch sensors and actuators must be aligned and within 1/16" (1.6 mm). (1) Sensor, (2) Actuator

MAINTENANCE
Electrical Assembly

("Electrical Assembly", con't. from page 39)

No LEDs are illuminated: verify power to terminals L1 and L2. If there is power and the LEDs are not illuminated, turn the power disconnect/lockout switch to "O" (OFF) and lock out power source. Remove fuses (see Figure 27) and check with ohmmeter. Replace faulty fuse. If problem persists, contact Urschel Laboratories.

Red "relay condition" LEDs and any of the red "switch output" LEDs are illuminated: the circuit for the sensor or resistor assigned to that location is open. If red "switch output" LEDs which correspond to a sensor are illuminated, disconnect and lock out the power source, and perform the safety switch inspection (see "Safety switches", page 39). If red "switch output" LEDs which correspond to a resistor are illuminated, disconnect and lock

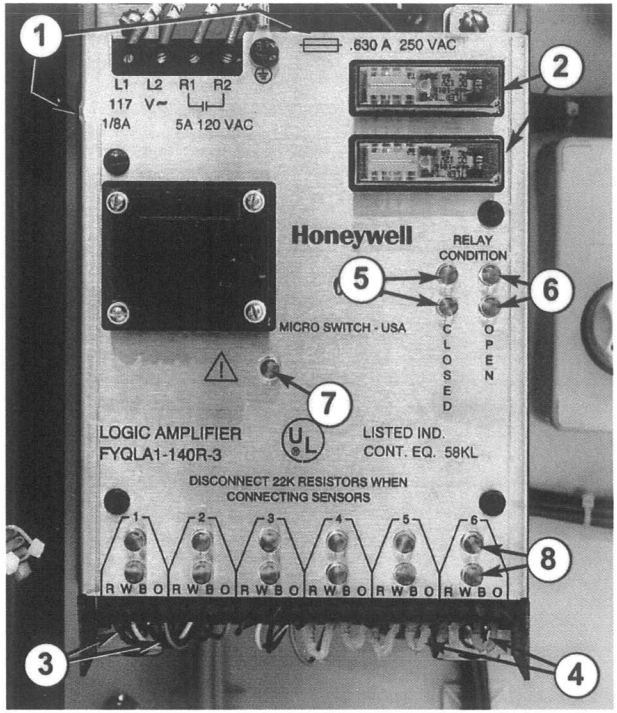


Figure 27 — Amplifier. (1) Fuses, (2) Relays, (3) Sensor Leads, (4) Resistors, (5) Green "Relay Condition" LEDs, (6) Red "Relay Condition" LEDs

Resistors and sensor leads: Check dielectric grease coating on resistors, sensor leads and terminal strip. Dielectric grease provides a moisture barrier to reduce the potential for premature amplifier failure. If resistors, sensor leads and terminal strip need to be greased, use only dielectric tune-up grease. Generously fill each hole on bottom of lower terminal strip and each screw terminal hole for the sensor leads, and coat each resistor with the grease. Use a small brush to smooth out grease and ensure grease completely covers terminal strip area (Figure 28).

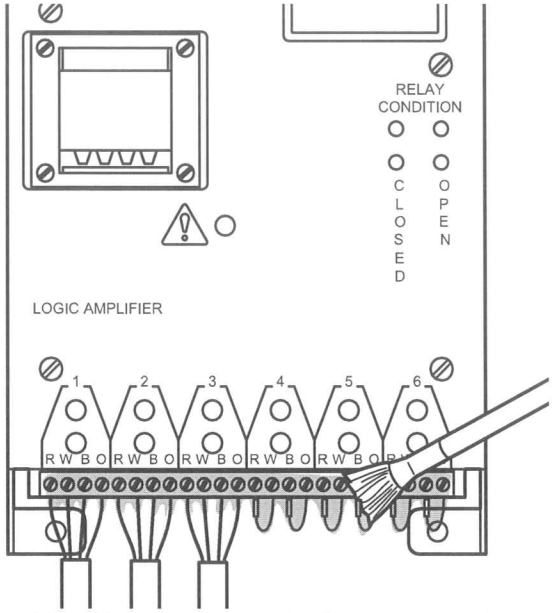


Figure 28 — For moisture protection, generously coat resistors, sensor leads, screw terminal holes and terminal strip area with dielectric tune-up grease.

MAINTENANCE

Troubleshooting

PROBLEM	CAUSE	CORRECTION
Unsatisfactory Cuts or Excessive Scrap	Dull knives	Replace as required. See "Knife Replacement", pages 36-37.
	Product build-up on contact parts	Clean cutting unit and maintain regular cleaning schedule. See "Cleaning", pages 32–33.
Harsh, Metallic Grinding Sound	Worn motor bearings	Run motor with belts removed to verify. Consult motor manufacturer.
Slow, Sluggish Operation	Drive belts slipping	Replace worn or frayed belts and adjust belt tension. Make sure belts are clean, dry and free of grease. Check for worn pulley grooves and replace if necessary.
	Lack of lubrication or improper lubricant	See "Lubrication", pages 34–35.
	Loss of one phase of	Perform complete electrical check on motor

PROBLEM	CAUSE	CORRECTION
Machine Does Not Start	Power disconnect/lock-out switch is in the "O" (OFF) position	Turn power disconnect/lockout switch to the "I" (ON) position, page 26.
	Guards and covers not securely closed, attached or fastened	Make sure guards and covers are securely closed, attached and fastened. Check for bent or twisted guards or covers that will prevent switches from lining up. See "Covers and Guards", page 30.
	Overload relay tripped	Wait 5 minutes. Press "RESET" button. See "Motor Overload", page 28.
	Amplifier malfunction	Check amplifier. See "Amplifier", pages 39–40 or "Electrical Schematic", pages 68–69.
	Blown fuses	Check main, transformer and amplifier fuses. See "Inspection", pages 38–41.
	Electrical system mal-function	Inspect electrical system. See "Inspection", pages 38–41.

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PARTS

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ORDERING PARTS

When ordering parts be sure to include the following information:

- **Machine Model and Serial Number**
- **Quantity**
- **5 Digit Part Number**
- **Part Description**

The serial number of your machine is on the name plate located on the machine frame. Orders are accepted by mail, telephone or facsimile. Do not use illustration numbers when ordering parts.

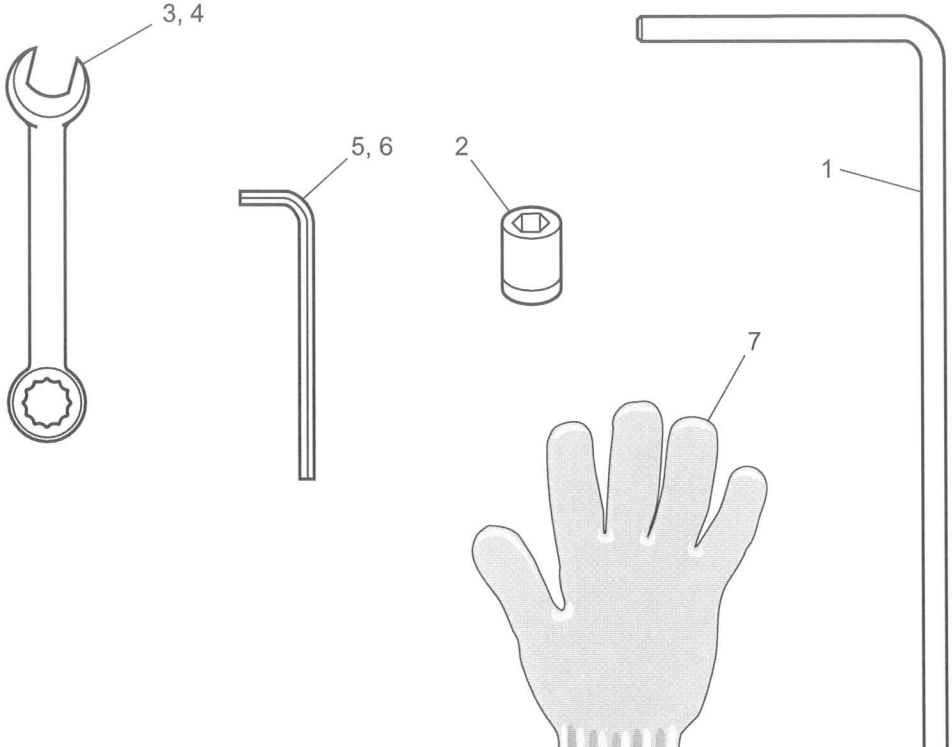
RETURNING PARTS FOR REPAIR

1. Pack part(s) securely to avoid damage during shipping.

2. Enclose purchase order number and letter of instruction for repair work. Note any special

PARTS

Tools

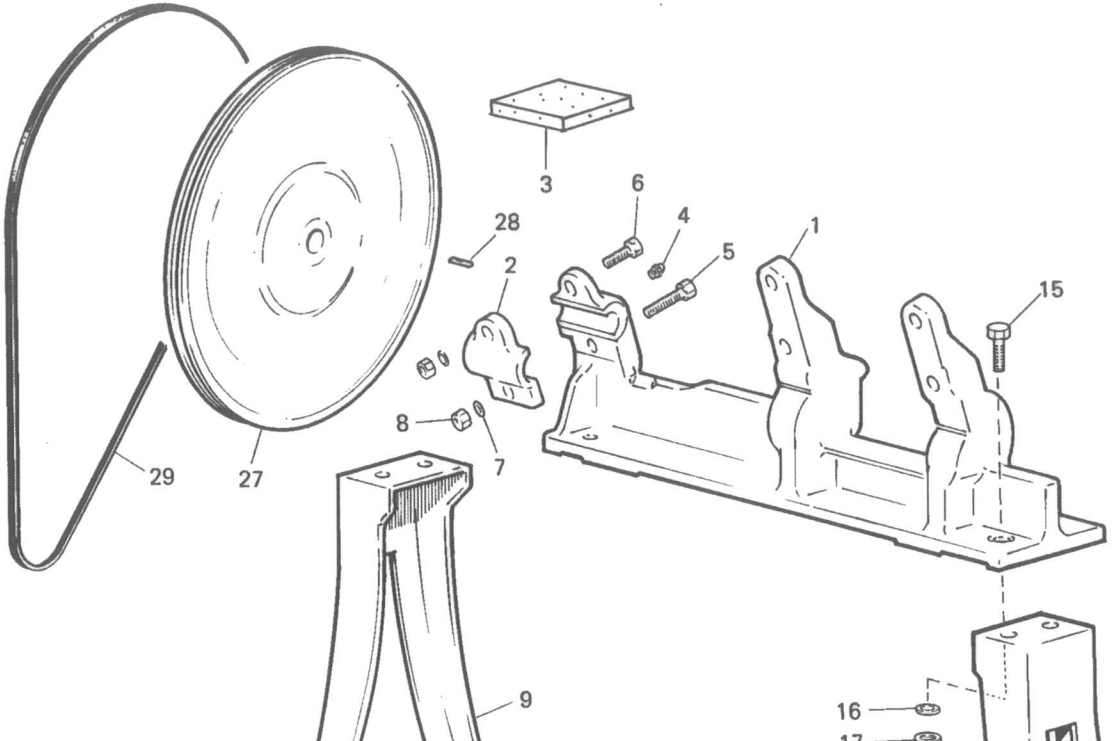


PARTS
Tools

ITEM NO.	PART NO.	DESCRIPTION	QTY.
1	62297	**Wrench,** *"L" Handle*	1
2	11022	**Socket,** *3/4"*	1
3	11038	**Open End Wrench,** *7/16" x 1/2"*	1
4	11039	**Open End Wrench,** *1/2" x 9/16"*	1
5	11054	**Allen Wrench,** *1/4", long*	1
6	11059	**Allen Wrench,** *5/32"*	1
7	17453	**Protective Glove,** *medium, (fits hand sizes 7, 8 & 9)*	2
8	11070	**Grease Gun**	1
—	11045	**Grease Cartridge,** *(not shown)*	2
—	11071	**Tool Box,** *(not shown)*	1
OPTIONAL TOOLS (NOT SUPPLIED WITH MACHINE)			
—	17497	**Protective Glove,** *small, (fits hand sizes 5, 6 & 7)*	2
—	17498	**Protective Glove,** *large, (fits hand sizes 9, 10 & 11)*	2
TOOLS FOR KNIFE SHARPENING			
—	11004	**Buffing Wheel,** *10" diameter, (not shown)*	1
—	11005	**Buffing Compound,** *3 pound bar, (not shown)*	1

PARTS

Frame, Base and Motor



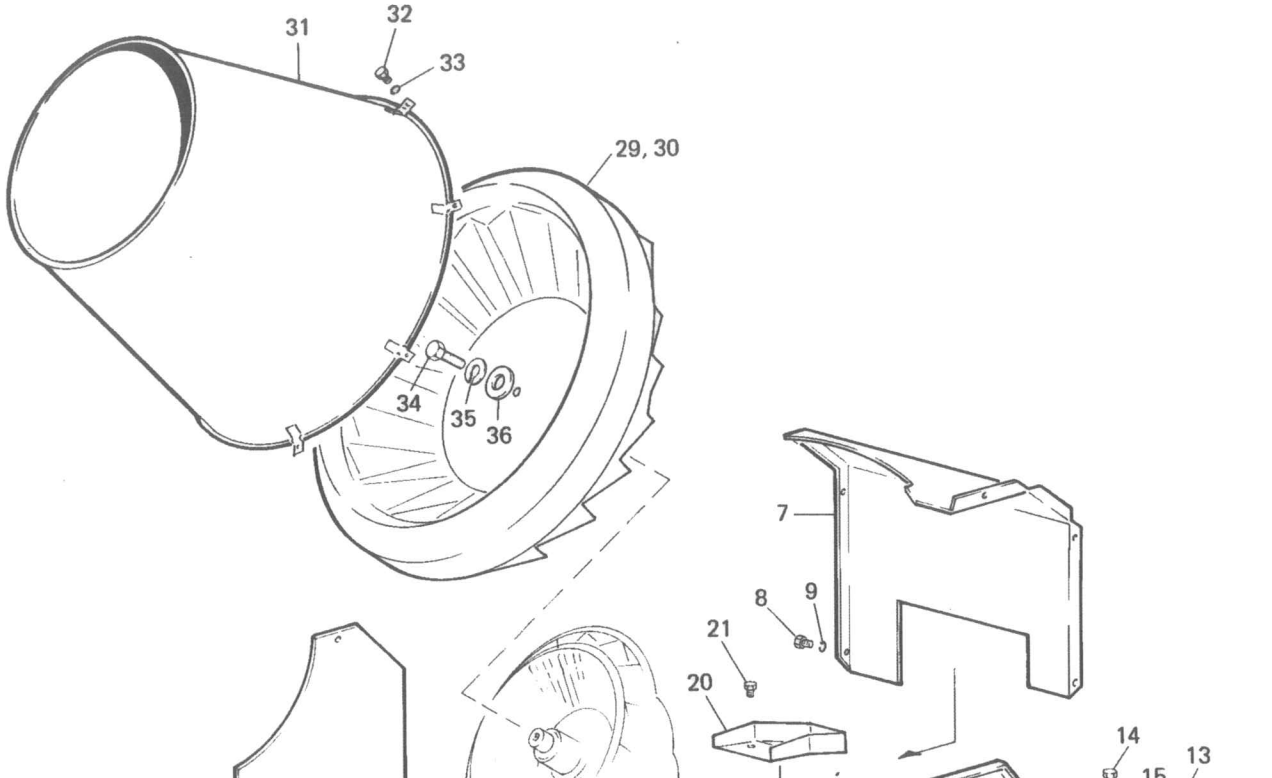
PARTS

Frame, Base and Motor

ITEM NO.	PART NO.	DESCRIPTION	QTY.
—	39031	**Main Frame Assembly,** *(includes items 1-8)*	1
1	39145	**Main Frame Casting,** *(available in assembly only)*	1
2	39035	**Bearing Cap**	1
3	562525*	**Babbit**	3.5 lbs
4	11402	**Grease Fitting,** *1/8", 65 degree, s.s.*	1
5	10063	**Hex Head Cap Screw,** *3/8-16 x 2-1/4", s.s.*	1
6	10061	**Hex Head Cap Screw,** *3/8-16 x 2-1/4", s.s.*	1
7	10015	**Lock Washer,** *3/8", s.s.*	2
8	10022	**Hex Nut,** *3/8-16, s.s.*	2
—	39312	**Base Assembly,** *(includes items 9-14)*	1
9	39044	**Leg**	2
10	39086	**Leg Brace**	2
11	10016	**Lock Washer,** *1/2", s.s.*	4
12	10026	**Hex Nut,** *1/2-13, s.s.*	4
13	39326	**Motor Base,** *stainless steel*	1
14	10289	**Cotter Pin,** *1/8" x 1", s.s.*	1
15	10076	**Hex Head Cap Screw,** *1/2-13 x 2", s.s.*	4
16	10016	**Lock Washer,** *1/2", s.s.*	4
17	10026	**Hex Nut,** *1/2-13, s.s.*	4
18	39338	**Motor,** *3/4 HP, 200-208-230/460 volts*	1
	39339	**Motor,** *3/4 HP, 220-380, 240/415 volts*	1
	39340	**Motor,** *3/4 HP, 575 volts*	1
19	10046	**Hex Head Cap Screw,** *5/16-18 x 7/8", s.s.*	4
20	10008	**Washer,** *flat, 5/16", s.s., thick*	4
21	10306	**Hex Nut,** *5/16-18, s.s., locking*	4

PARTS

Covers, Guards and Hoppers



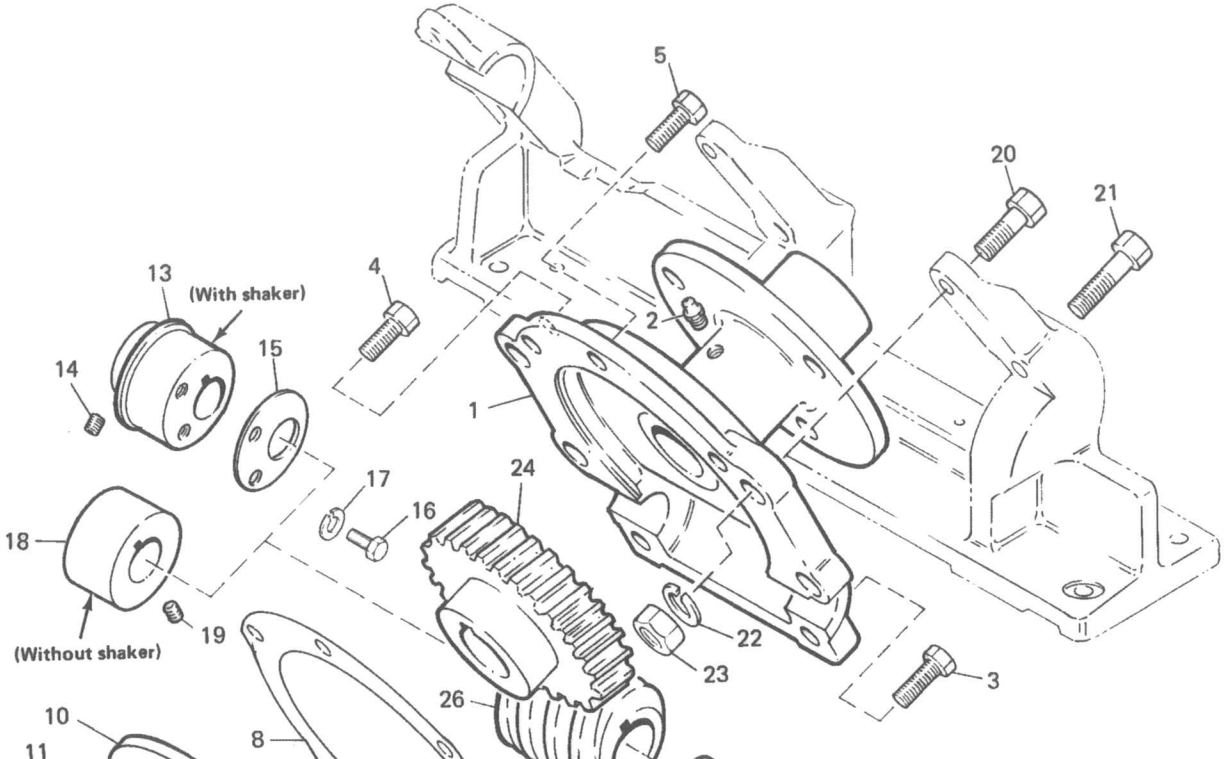
PARTS

Covers, Guards and Hoppers

ITEM NO.	PART NO.	DESCRIPTION	QTY.
1	39278	**Screen Cover,** *(machines with shaker assembly)*	1
2	10043	**Hex Head Cap Screw,** *5/16-18 x 1/2", s.s.*	2
3	10014	**Lock Washer,** *5/16", s.s.*	2
4	39276	**Side Cover,** *(machines with shaker assembly)*	1
5	10047	**Hex Head Cap Screw,** *5/16-18 x 1", s.s.*	2
6	10306	**Hex Nut,** *5/16-18, s.s., locking*	2
7	39277	**Back Cover,** *(machines with shaker assembly)*	1
	39341	**Back Cover,** *(machines without shaker assembly)*	1
8	10037	**Hex Head Cap Screw,** *1/4-20 x 1/2", s.s.*	6*
9	10013	**Lock Washer,** *1/4", s.s.*	6*
10	39273	**Front Cover,** *(machines with shaker assembly)*	1
11	10037	**Hex Head Cap Screw,** *1/4-20 x 1/2", s.s.*	5
12	10013	**Lock Washer,** *1/4", s.s.*	5
13	39126	**Belt Guard Cover**	1
14	10037	**Hex Head Cap Screw,** *1/4-20 x 1/2", s.s.*	4
15	10013	**Lock Washer,** *1/4", s.s.*	4
16	39125	**Belt Guard,** *back*	1
17	10047	**Hex Head Cap Screw,** *5/16-18 x 1", s.s.*	2
18	10014	**Lock Washer,** *5/16", s.s.*	2
19	10021	**Hex Nut,** *5/16-18, s.s.*	2
20	39059	**Grease Pan**	1
21	10038	**Hex Head Cap Screw,** *1/4-20 x 3/4", s.s.*	2
22	10013	**Lock Washer,** *1/4", s.s.*	2
23	10020	**Hex Nut,** *1/4-20, s.s.*	2
24	39258	**Discharge Chute,** *(machines without shaker assembly)*	1

PARTS

Gear Case and Eccentric Assemblies



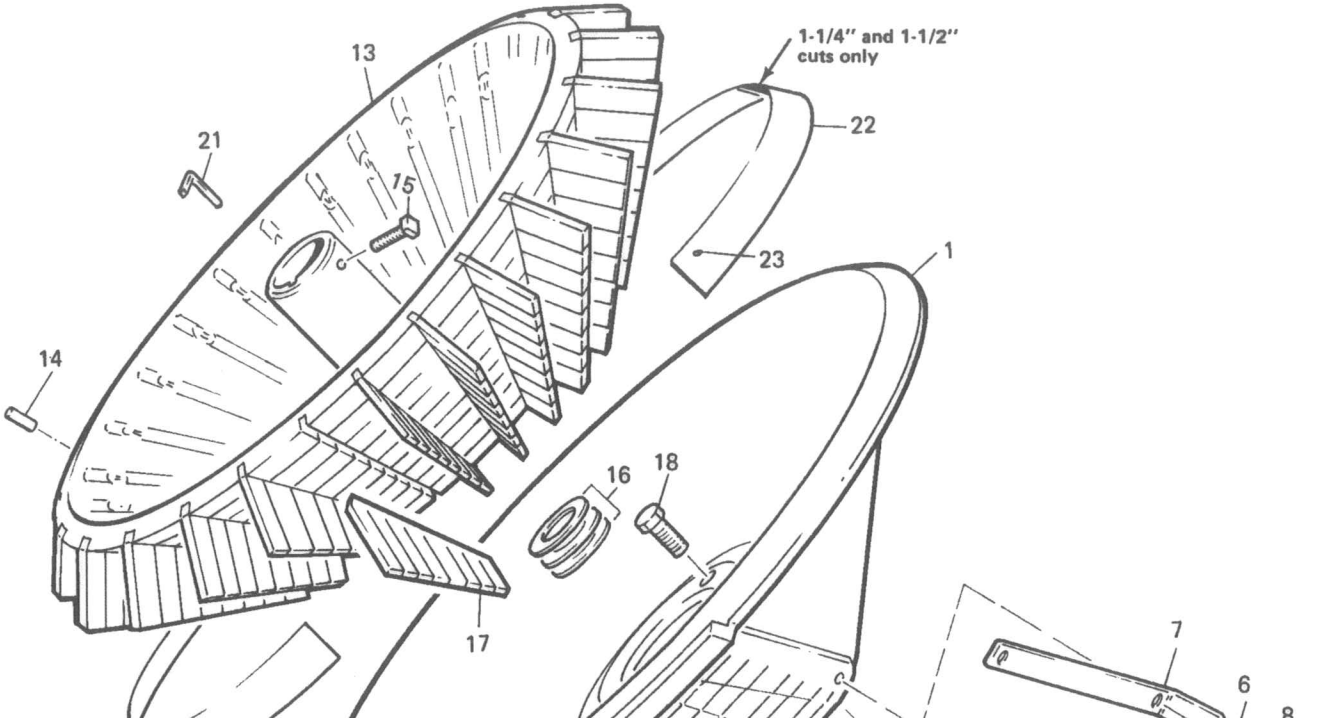
PARTS

Gear Case and Eccentric Assemblies

ITEM NO.	PART NO.	DESCRIPTION	QTY.
—	39034	**Gear Case Assembly,** *(includes items 1-12)*	1
1	39030	**Upper Gear Case,** *(includes item 2)*	1
2	11401	**Grease Fitting,** *1/8", straight, s.s.*	1
—	39354	**Bearing,** *1.25" x 1.50" x 1.50", (not shown)*	2
3	10062	**Hex Head Cap Screw,** *3/8-16 x 2", s.s.*	2
4	10060	**Hex Head Cap Screw,** *3/8-16 x 1-1/2", s.s.*	2
5	10059	**Hex Head Cap Screw,** *3/8-16 x 1-1/4", s.s.*	2
6	10015	**Lock Washer,** *3/8", s.s.*	5
7	10022	**Hex Nut,** *3/8", s.s.*	5
8	39067	**Gasket,** *gear case*	1
9	562525*	**Babbit**	7 lbs.
10	39032	**Lower Gear Case,** *(includes items 11 & 12)*	1
11	11401	**Grease Fitting,** *1/8", straight, s.s.*	1
12	11406	**Grease Fitting,** *1/4", straight, s.s.*	1
—	39355	**Bearing,** *1.25" x 1.50" x .75", (not shown)*	2
—	39038	**Eccentric Assembly,** *machines with shaker, (includes items 13-17)*	1
13	39036	**Eccentric,** *(includes item 14)*	1
14	10141	**Socket Set Screw,** *5/16-18 x 1/2", nylok, s.s.*	1
15	39037	**Eccentric Plate**	1
16	10043	**Hex Head Cap Screw,** *5/16-18 x 1/2", s.s.*	2
17	10014	**Lock Washer,** *5/16", s.s.*	2
18	39267	**Thrust Collar,** *machines without shaker, (includes item 19)*	1
19	10141	**Socket Set Screw,** *5/16-18 x 1/2", nylok, s.s.*	1
20	10077	**Hex Head Cap Screw,** *1/2-13 x 2-1/4", s.s.*	2

PARTS

Cutting Parts

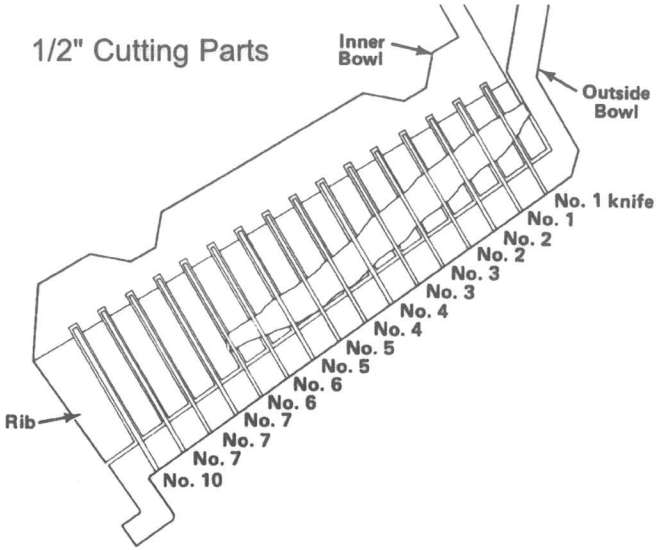


ITEM NO.	PART NO.	DESCRIPTION	QTY.
—	*	**Outside Bowl Assembly,** *(includes items 1—10)*	1
1	*	**Outside Bowl,** *not sold separately*	1
2	*	**Knife,** *release, (includes items 3 & 4)*	1
3	39073	**Knife Bolt with Nut,** *(for 1/2", 1", and 2" size cuts)*	*
	39074	**Knife Bolt with Nut,** *(for .800", 1-1/4" and 1-1/2" size cuts)*	*
4	39072	**Spring**	*
5	10049	**Hex Head Cap Screw,** *5/16-18 x 1-1/2", s.s.*	2
6	10014	**Lock Washer,** *5/16", s.s.*	4
7	*	**Knife Holder Bar**	1
8	10044	**Hex Head Cap Screw,** *5/16-18 x 5/8", s.s.*	2
9	10043	**Hex Head Cap Screw,** *5/16-18 x 1/2", s.s.*	2
10	10008	**Washer,** *flat, 5/16", s.s., thick*	2
11	*	**Set of Knives,** *slicing, short*	1
12	39016	**Knife,** *slicing, long*	1
—	*	**Inner Bowl Assembly,** *(includes items 13—17)*	1
13	*	**Inner Bowl,** *not sold separately*	1
14	39068	**Hopper Drive Stud**	1
15	10549	**Square Head Set Screw,** *1/2-13 x 1"*	2
16	39071	**Inner Bowl Shim**	3
17	*	**Rib,** *stainless*	24
18	10075	**Hex Head Cap Screw,** *1/2-13 x 1-3/4", s.s.*	3
19	10016	**Lock Washer,** *1/2", s.s.*	3
20	10026	**Hex Nut,** *1/2-13, s.s.*	3
21	39123	**Drive Key**	1

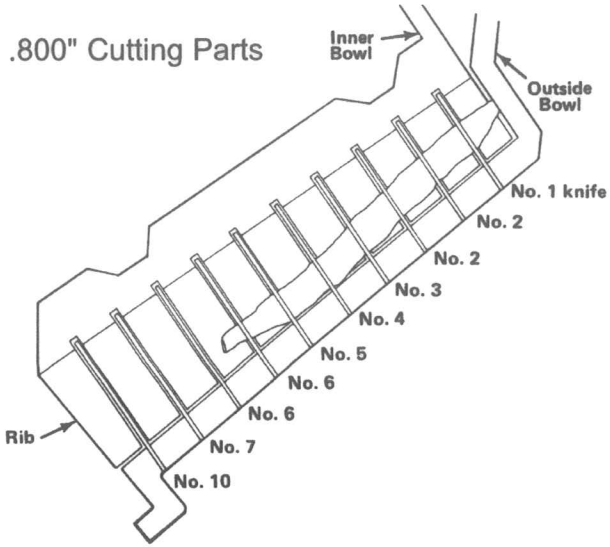
PARTS

Cutting Parts

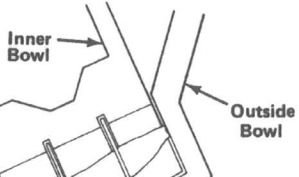
1/2" Cutting Parts



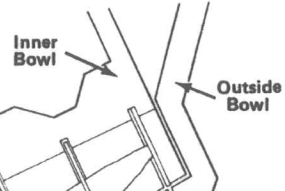
.800" Cutting Parts



1" Cutting Parts



1-1/4" Cutting Parts



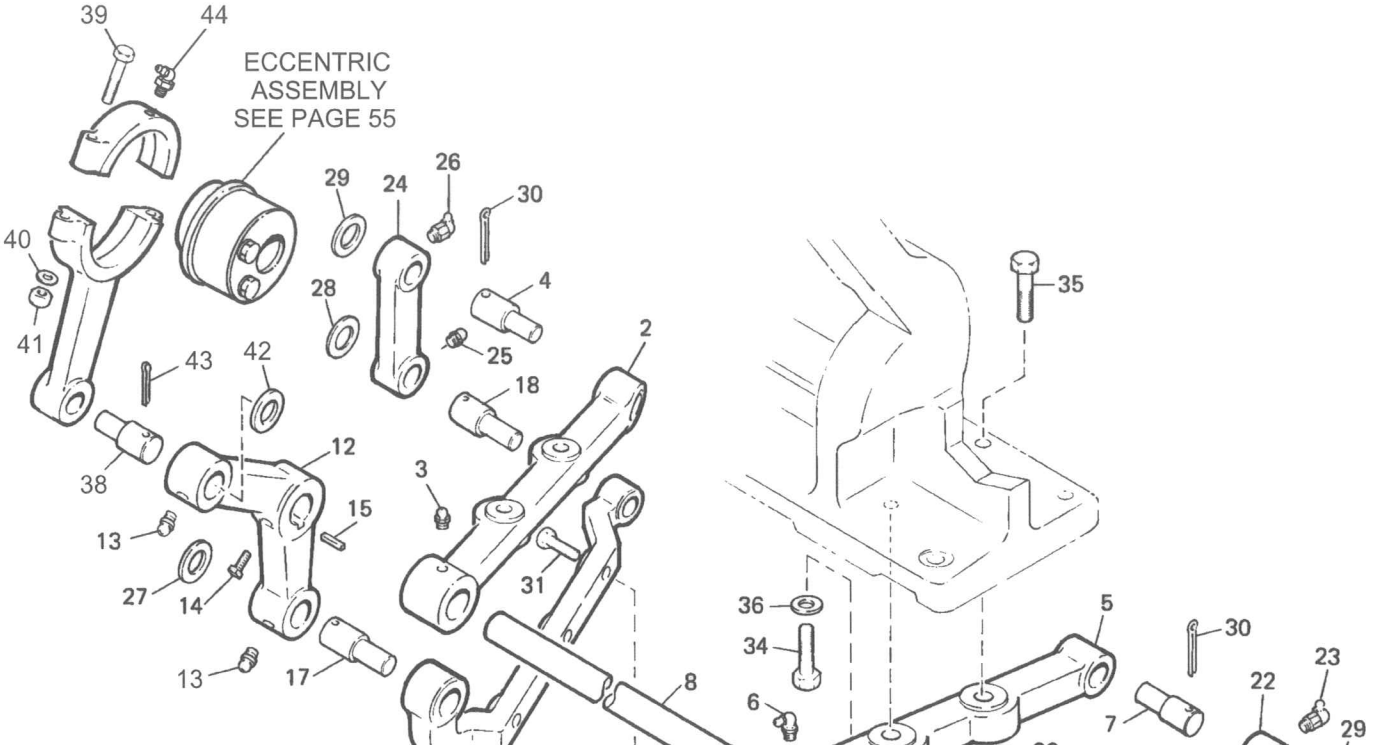
NOTE: *Illustrations on page 58 are* ***Cross Section Top View*** *of bean entering the knife area. Item numbers in the charts below refer to the illustration and parts list on pages 56 & 57.*

Outside Bowl Assembly					
Size of Cut	Outside Bowl Ass'y. No.	Item 1 Outside Bowl	Item 2 Knife Release	Item 7 Knife Holder Bar	Item 11 Knife Set
1/2" (12.7 mm)	39022	39135	39040	39055	39111
.800" (20.3 mm)	39021	39136	39041	39057	39112
1" (25.4 mm)	39022	39135	39040	39055	39113
1-1/4" (31.8 mm)	39023	39137	39042	39056	39114
1-1/2" (38.1 mm)	39022	39135	39040	39055	39115
2" (50.8 mm)	39022	39135	39040	39055	39116

Inner Bowl Assembly			
Size of Cut	Inner Bowl Ass'y. No.	Item 13 Inner Bowl	Item 17 Rib No.
1/2" (12.7 mm)	39027	39135	39299

PARTS

Shaker Assembly



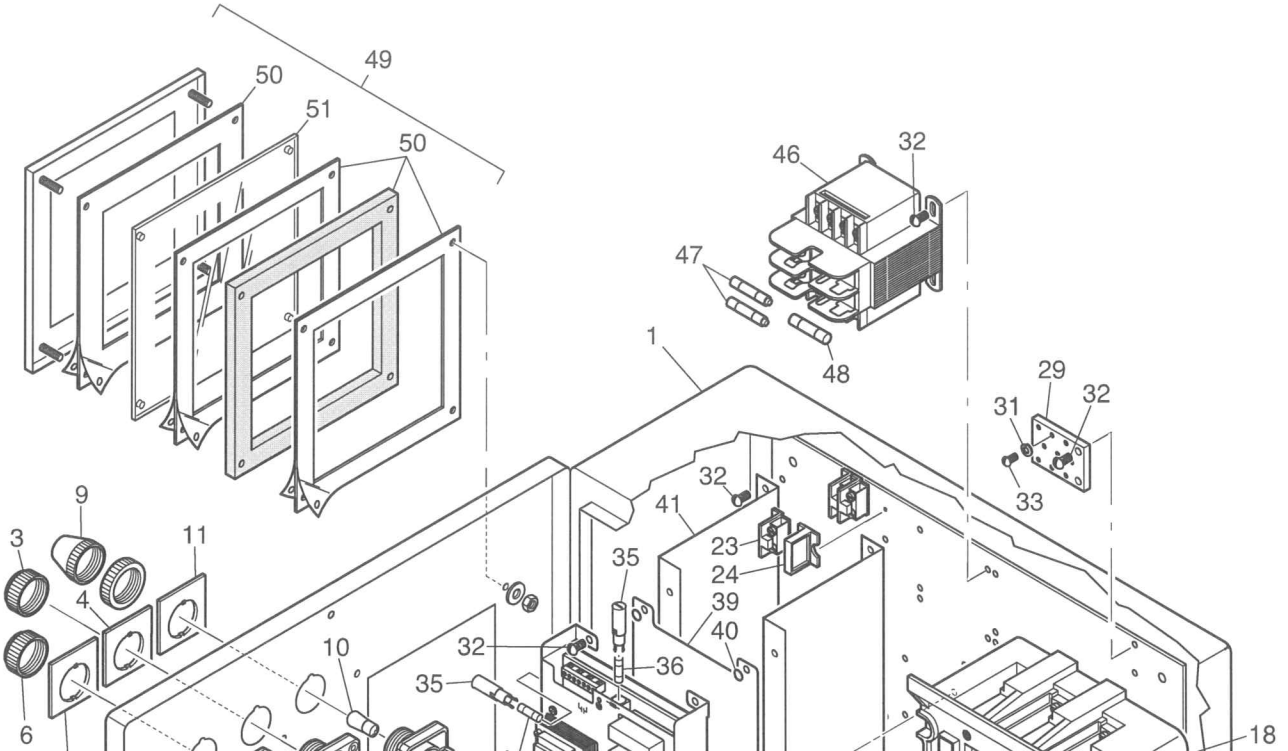
PARTS

Shaker Assembly

ITEM NO.	PART NO.	DESCRIPTION	QTY.
1	39070	**Shaker Screen Assembly**	1
—	39075	**Shaker Support Assembly,** *(includes items 2-30)*	1
2	39048	**Shaker Hanger,** *right, (includes items 3 & 4)*	1
3	11406	**Grease Fitting,** *1/4", straight, s.s.*	1
4	39063	**Stud,** *2-3/8"*	1
5	39122	**Shaker Hanger,** *left, (includes items 6 & 7)*	1
6	11408	**Grease Fitting,** *1/4", 90 degree, s.s.*	1
7	39063	**Stud,** *2-3/8"*	1
8	39085	**Shaker Shaft**	1
9	39049	**Upper Shaker Arm,** *(includes items 10 & 11)*	1
10	11406	**Grease Fitting,** *1/4", straight, s.s.*	1
11	10522	**Square Head Set Screw,** *5/16-18 x 5/8", s.s.*	1
12	39050	**Shaker Crank Arm,** *includes items 13 & 14)*	1
13	11406	**Grease Fitting,** *1/4", straight, s.s.*	2
14	10522	**Square Head Set Screw,** *5/16-18 x 5/8", s.s.*	1
15	39196	**Woodruff Key,** *3/16"*	2
16	39064	**Shaker Bracket,** *right, (includes items 17 & 18)*	1
17	39061	**Stud,** *2-1/4"*	1
18	39062	**Stud,** *2"*	1
19	39065	**Shaker Bracket,** *left, (includes items 20 & 21)*	1
20	39061	**Stud,** *2-1/4"*	1
21	39062	**Stud,** *2"*	1
22	39047	**Lower Shaker Arm,** *left, (includes item 23)*	1
23	11417	**Grease Fitting,** *1/4", 65 degree*	2
24	39296	**Lower Shaker Arm,** *right, (includes items 25 & 26)*	1

PARTS

Electrical Assembly (NEMA)



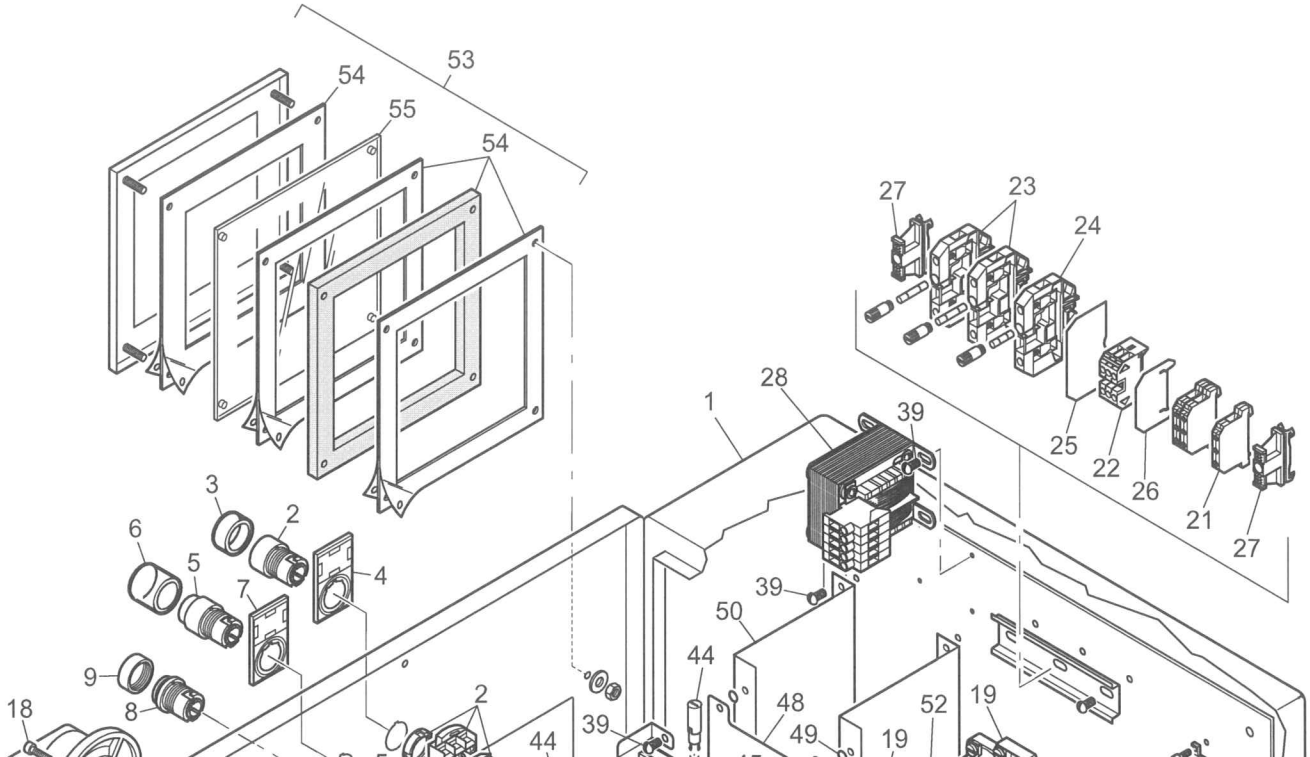
PARTS

Electrical Assembly (NEMA)

ITEM NO.	PART NO.	DESCRIPTION	QTY.
—	39357	**Electrical Assembly,** *with shaker, (includes items 1–48)*	1
—	39358	**Electrical Assembly,** *without shaker, (includes items 1-48)*	1
1	22713	**Combination Starter,** *size "1" (includes items 2–29)*	1
2	13449	**Push Button,** *start (includes item 3)*	1
3	60218	**Rubber Boot,** *start*	1
4	12605	**Legend Plate,** *start*	1
5	13450	**Push Button,** *stop, (includes item 6)*	1
6	60219	**Rubber Boot,** *stop*	1
7	12606	**Legend Plate,** *stop*	1
8	12597	**Pilot Light,** *(includes items 9–10)*	1
9	12598	**Lens,** *pilot light*	1
10	12599	**Bulb,** *pilot light*	1
11	12600	**Plate,** *pilot light*	1
12	12603	**Reset Button,** *(includes item 13)*	1
13	12604	**Rubber Boot,** *reset*	1
14	16676	**Starter,** *size "1", (includes items 15–17)*	1
15	12667	**Overload Relay**	1
16	13548	**Operating Coil,** *for size 0 & 1 starter*	1
17	63579	**Auxiliary Contact,** *normally open*	1
18	13604	**Disconnect,** *30 amp*	1
19	63383	**Operating Handle**	1
20	63384	**Connecting Rod**	1
21	13605	**Fuse Trailer Block,** *(includes item 22)*	1
22	13381	**Fuse Clip Kit,** *(set of 6)*	1
23	11606	**Terminal Block**	3
24	11607	**End Section,** *terminal block*	2
25	12882	**Door Gasket,** *(fitting and adhesive required)*	1

PARTS

Electrical Assembly (CE compliant)



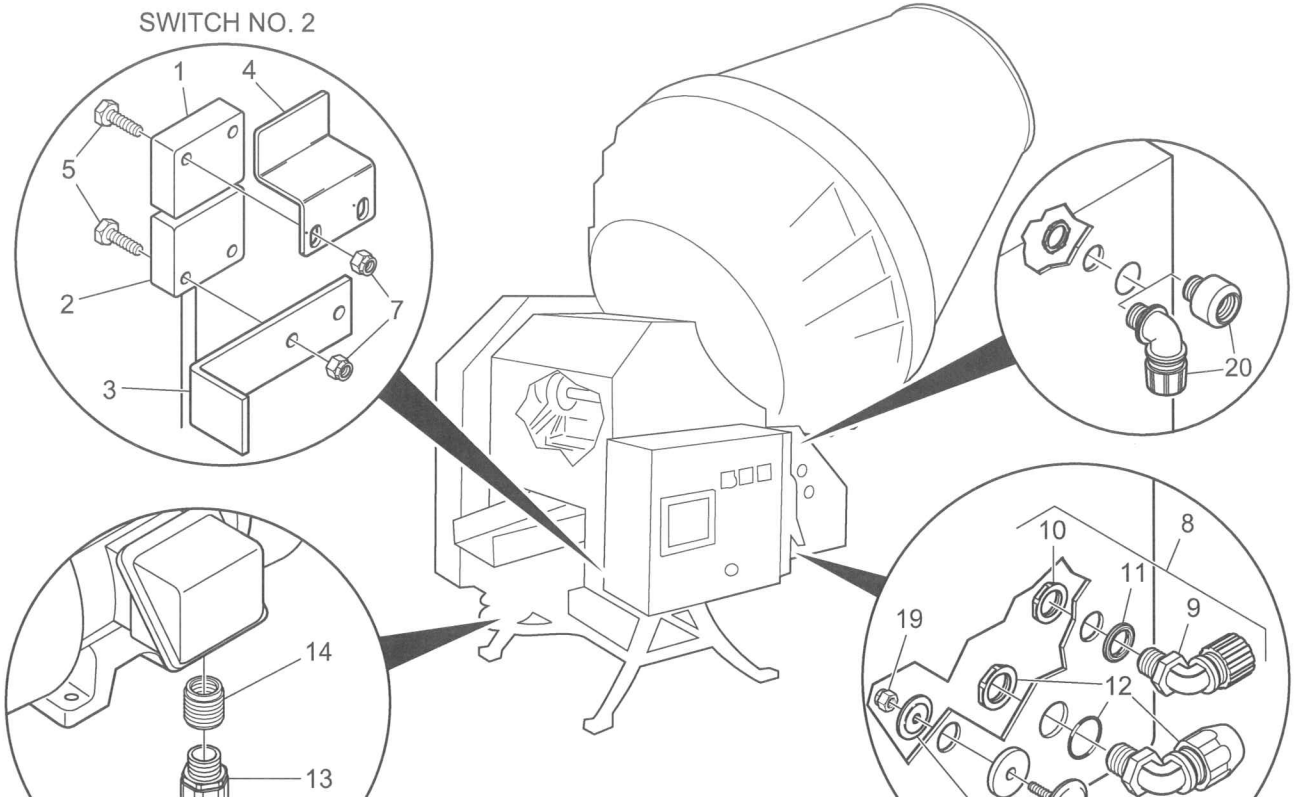
PARTS

Electrical Assembly (CE compliant)

ITEM NO.	PART NO.	DESCRIPTION	QTY.
—	39364	**Electrical Assembly,** *IEC, with shaker, (includes items 1–52)*	1
—	39365	**Electrical Assembly,** *IEC, without shaker, (includes items 1-52)*	1
1	23103	**Combination Starter with Lugs,** *IEC, 22 amp.,(includes items 2–36)*	1
2	12740	**Start Button Assembly,** *(includes item 3)*	1
3	12748	**Protective Cap,** *flush head, IEC*	1
4	12742	**Name Plate,** *(I) start, IEC*	1
5	12741	**Stop Button Assembly,** *(includes item 6)*	1
6	12749	**Protective Cap,** *extended head, IEC*	1
7	12743	**Name Plate,** *(O) stop, IEC*	1
8	12757	**Pilot Light,** *IEC, (includes items 9–10)*	1
9	12758	**Pilot Light Lens,** *IEC*	1
10	12599	**Bulb,** *pilot light, IEC*	1
11	12747	**Reset Button Assembly,** *IEC, (includes item 12–14)*	1
12	12744	**Reset Button,** *IEC*	1
13	12748	**Protective Cap,** *flush head, IEC*	1
14	12745	**Reset Extender,** *IEC*	1
15	12746	**Reset Insert with Holder**	1
16	12774	**IEC Disconnect Switch Handle**	1
17	12942	**Disconnect Switch,** *3 pole, non-fusible, 40A*	1
18	12782	**Machine Screw,** *4 mm x 16 mm*	2
19	13491	**Fuse Base,** *25 amp., E27 thread*	1
20	13489	**Screw Cap,** *E27 thread*	3
21	12750	**Earthing Terminal,** *IEC*	3
22	12760	**Terminal,** *IEC*	3
23	12764	**Fuse Terminal,** *6.3 x 32 mm, IEC, (uses fuse 13675; includes item 25)*	2
24	12763	**Fuse Terminal,** *5 x 20 mm, IEC, (uses fuse 13674; includes item 25)*	1
25	*	**Barrier and Spacer,** *IEC*	1
26	*	**Barrier,** *IEC*	1

PARTS

Electrical Assembly, Switches



PARTS

Electrical Assembly, Switches

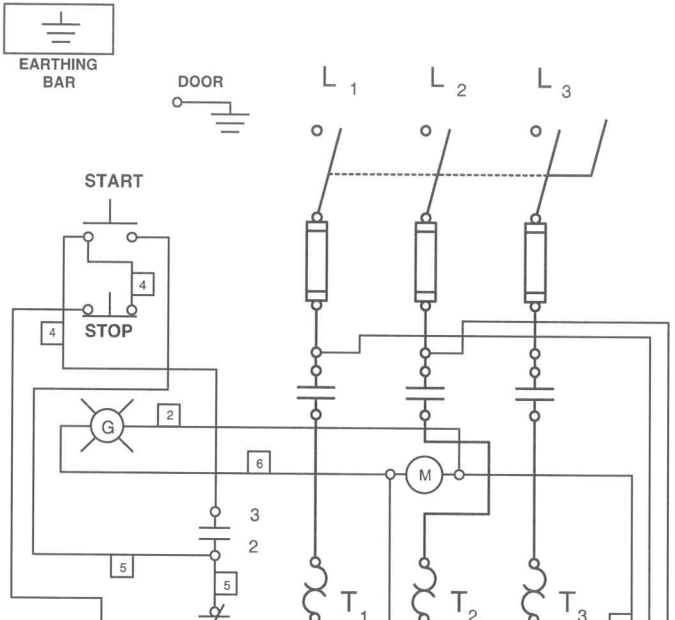
Electrical assemblies include the following items 1–19.

ITEM NO.	PART NO.	DESCRIPTION	QTY.
1	63741	**Actuator**	2*
2	63738	**Sensor,** *6' lead*	2*
3	19362	**Sensor Bracket**	2
4	24247	**Actuator Bracket**	2
	39323	**Actuator Bracket,** *(machines without shaker)*	1
5	10351	**Hex Head Cap Screw,** *10-24 x 7/8"*	8*
6	10349	**Hex Head Cap Screw,** *10-24 x 1-1/2", (machines without shaker)*	2
7	10231	**Hex Nut,** *locking, 10-24*	8*
8	11548	**Cord Connector,** *90°, .250/.375, (includes items 9–11)*	2*
9	11609	**Cord Connector,** *90°, .250/.375*	1
10	11611	**Lock Nut,** *1/2"*	1
11	11900	**Seal Washer,** *3/16 x 7/8 x 1-9/32"*	1
12	11614	**Conduit Connector,** *1/2", 90°*	1
13	11613	**Conduit Connector,** *1/2", straight*	1
14	11502	**Conduit Bushing,** *1/2 x 3/4"*	1
15	13424	**Clip,** *chain*	1
16	13465	**Clip,** *cable tie*	6*
17	11513	**Cable Tie**	9*
18	11553	**Hole Seal**	1*
19	10231	**Hex Nut,** *locking, 10-24*	1*

* *See chart below.*

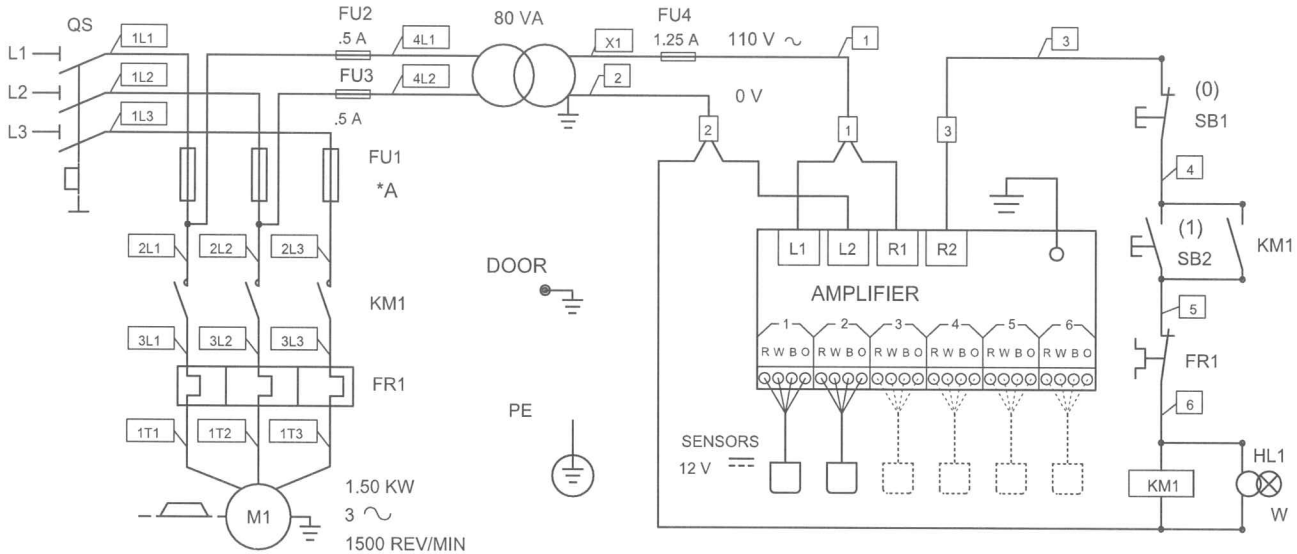
PARTS

Electrical Schematic (NEMA)



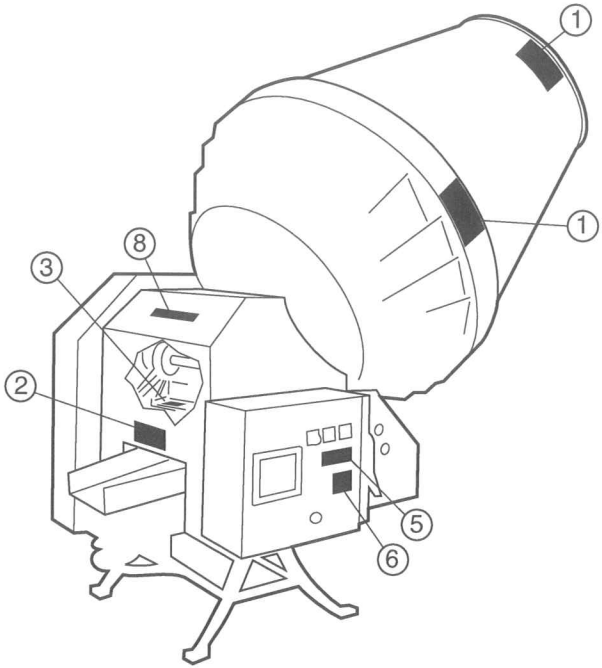
PARTS

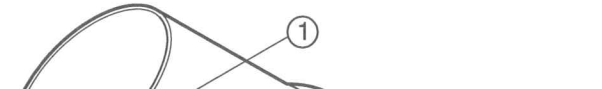
Electrical Schematic (CE compliant)



PARTS

Safety Signs and Machine Labels





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② 

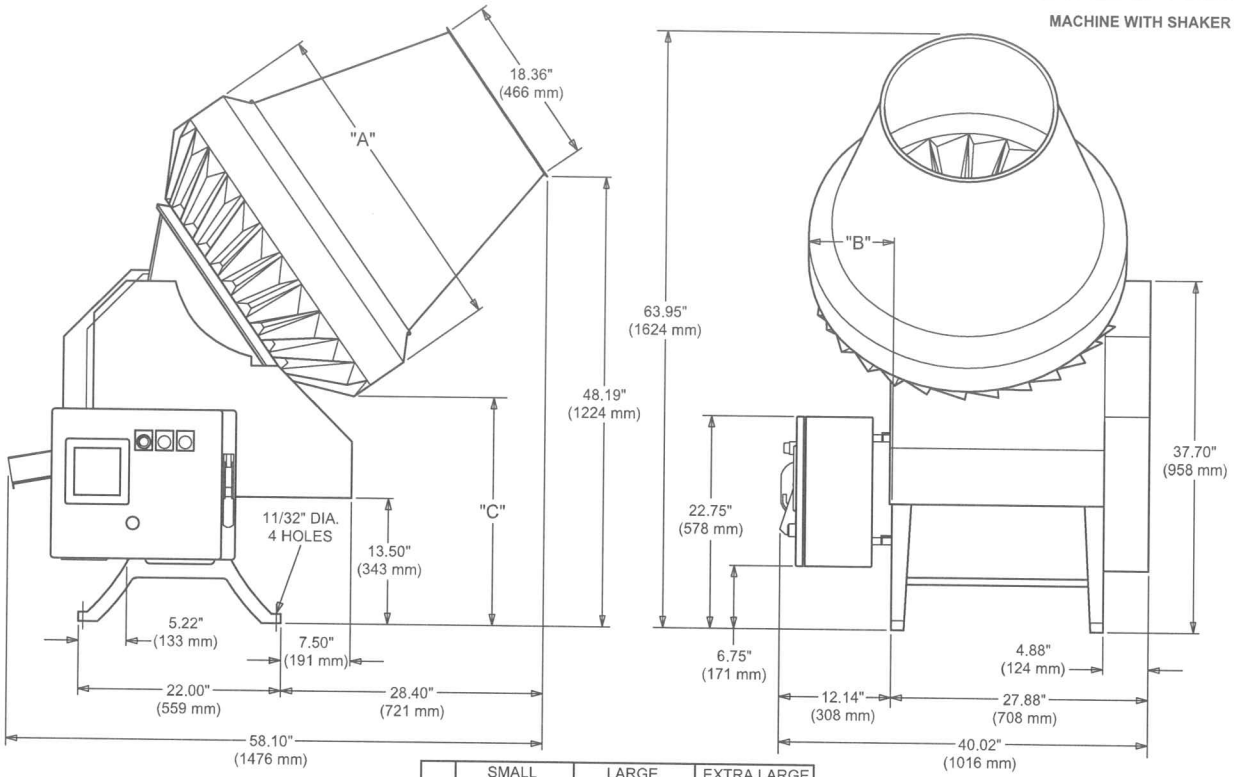
③ 

④ 

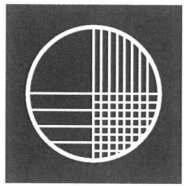
	①	②	③	④	⑤
ENGLISH	11662	11663	11665	11666	11667
CHINESE (Ch)	11724	11725	11727	11723	11728
CZECHOSLOVAKIAN (Cz)	11868	11869	11871	11872	11873
DANISH (Da)	11793	11794	11796	11797	11798
DUTCH (Du)	11716	11717	11719	11720	11721
FINNISH (Fi)	11758	11759	11761	11762	11763
FRENCH (F)	11674	11675	11677	11678	11679
GERMAN (Ge)	11681	11682	11684	11685	11686
GREEK (Gr)	11737	11738	11740	11741	11742
HUNGARIAN (Hu)	11772	11773	11775	11776	11777
INDONESIAN (In)	11751	11752	11754	11755	11756
ITALIAN (It)	11702	11703	11705	11706	11707
JAPANESE (J)	11688	11689	11691	11692	11693
POLISH (Pol)	11730	11731	11733	11734	11735

PARTS

Dimensional Drawing



DIM.	SMALL HOPPER 39100	LARGE HOPPER 39104	EXTRA LARGE HOPPER 39245



URSCHEL

LABORATORIES INCORPORATED

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