This manual contains additional publications. These publications are located at the front of the manual.

Supplement **L3235**: Brake Assembly, 10 pound-foot, Stearns Model 56200

Addendum **L3290**: May 2019

Instruction Manual

MODEL CC-D

- SAFETY
- GENERAL INFORMATION
- INSTALLATION
- OPERATION
- MAINTENANCE
- PARTS

URSCHEL
LABORATORIES INCORPORATED

URSCHEL®
The Global Leader in Food Cutting Technology
CORPORATE HEADQUARTERS
1200 Cutting Edge Drive
Chesterton, Indiana 46304 U.S.A.
Corporate: +1.219.464.4811 Fax: +1.219.462.3879
Toll Free: +1.844.URSCHEL (877.2435)
www.urschel.com info@urschel.com
Inquiries regarding technical publications: techpubs@urschel.com

Brake Assembly, 10 pound-foot, Stearns Model 56200 **S.1**
Brake Maintenance
Supplement to the machine manuals
Publication Description: SUPPLEMENT, ENGLISH, BRAKE MAINTENANCE, STEARNS 56200, 10LB
Publication Number: **L3235**
Date issued: December 2018

IMPORTANT SAFETY INFORMATION

Contents **Page**

Using this Supplement

This supplement contains information about adjusting and repairing the ***10 pound-foot brake (1)*** manufactured by Stearns. Stearns brakes are attached to 2, 3 and 5 hp motors used on Urschel machines. A properly maintained motor brake is an essential part of the safety system on your Urschel machine. This information is in addition to the information available from the brake manufacturer*. Use this supplement with the instruction manual for your machine.

Contact your Urschel representative or the Urschel Service Department if there are any questions regarding safe operation and servicing your machine. Contact information is at the end of this publication. Information for ordering an instruction manual is also at the end of this publication.

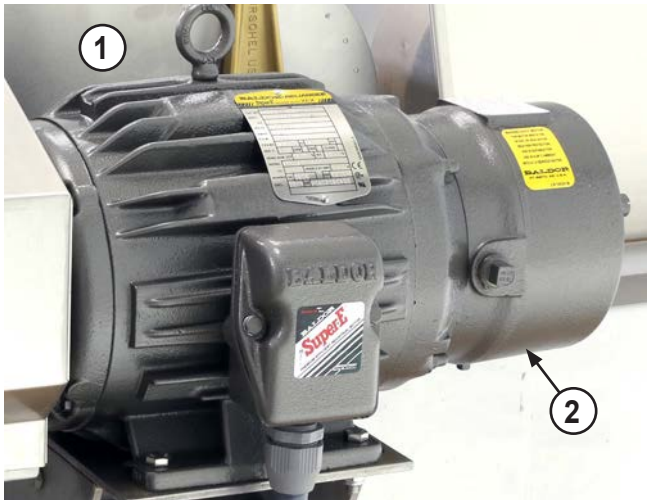
Urschel strongly recommends that persons responsible for plant safety programs read this entire supplement, evaluate their machines and procedures, and act on the instructions in this supplement.

Importance of the Motor Brake

The motor brake, described on the following pages, is a critical component of the machine safety system. The brake is used to rapidly decelerate and stop the motor and rotating parts. Rotating parts include knife spindles and knife wheels, gears, conveyor rolls, and any other parts driven by the motor. The brake is intended to reduce the likelihood of an operator removing or opening guards and exposing rotating parts. Contact with rotating parts can cause serious injury such as amputation. Maintaining the brake to ensure the minimum stop time is essential for safe machine operation. A brake that is not properly maintained may allow an operator to open guards while parts are still rotating.

* Stearns® manufactures the motor brake. Visit the Stearns website for additional important information.
www.stearnsbrakes.com/files/90560_stearns_1056x00_series_all_revisions_manual_.aspx

Brake Motor



The ***brake motor (1)*** reduces the risk of a person coming into contact with rotating cutting parts as they decelerate and stop. The ***brake (2)*** is intended to stop cutting parts quickly when the safety circuit is interrupted (opened) or when the stop button or emergency stop button is pressed. See Testing the Brake in this supplement for more information.

The brake contains components that wear and must be inspected regularly to ensure the correct stop time. If the recommended stop time is exceeded, adjust or repair the brake promptly. See the following pages.

Urschel recommends that customers operate the machine only if it has a brake motor. The goal of Urschel is to help ensure a safe machine operating environment. Urschel can provide a quote for a brake motor or brake repair parts. Please contact Urschel with any questions regarding the safe operation of your machine.

⚠ WARNING

Failure to maintain the brake and recommended stop time can lead to serious injury such as amputation! An improperly maintained brake can allow excessive coasting time of rotating parts, allowing an operator to remove guards and expose rotating knives. Check the stop time regularly. Adjust and repair the brake to maintain the correct stop time.

Testing the Brake

⚠ WARNING

Qualified trained personnel are required to perform this test. Any problems found during this test must be corrected by qualified personnel before the machine is operated, or serious injury such as amputation could result.

IMPORTANT

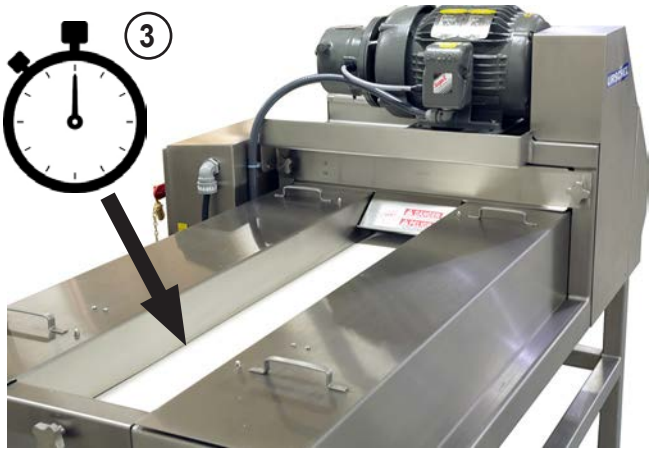
Excessive heat from frequent stops at short intervals can damage the motor and brake. Allow the brake to cool for at least two minutes each time the motor is started or stopped before continuing the test.

1. ***Start the machine (1).*** Use the Start-Up Procedure in the operation section of the machine ***instruction manual (2)***. Wait 10 seconds for the machine to reach full operating speed.

2. **Note the *stop time (3)* of moving and rotating parts.** See the machine instruction manual or manual addendum for stop time and a method to check for rotating parts. For example, the machine in the photo to the right has a feed belt that can be checked for stop time. Other machines have different parts to check.

   Push the stop button and note the stop time. A brake in good condition and properly adjusted will stop mechanical parts within the specified time.

3. **If the stop time exceeds the specified stop time,** adjust or repair the ***brake (4)***. See the following pages for information on adjusting and repairing the brake.



Adjusting the Brake

The following instructions apply to the Stearns Series 1-056,200 10 pound-foot brake (also referred to as 56,200). Stearns manufactured four versions of this brake: Original (pre-revision), REV A, REV B and REV C.

The REV C brake is supplied on new machines at the time of this publication and is shown in this publication. Adjustment and repair information is the same for earlier versions except as noted. Older machines used an earlier brake model; contact your Urschel representative for replacement information.

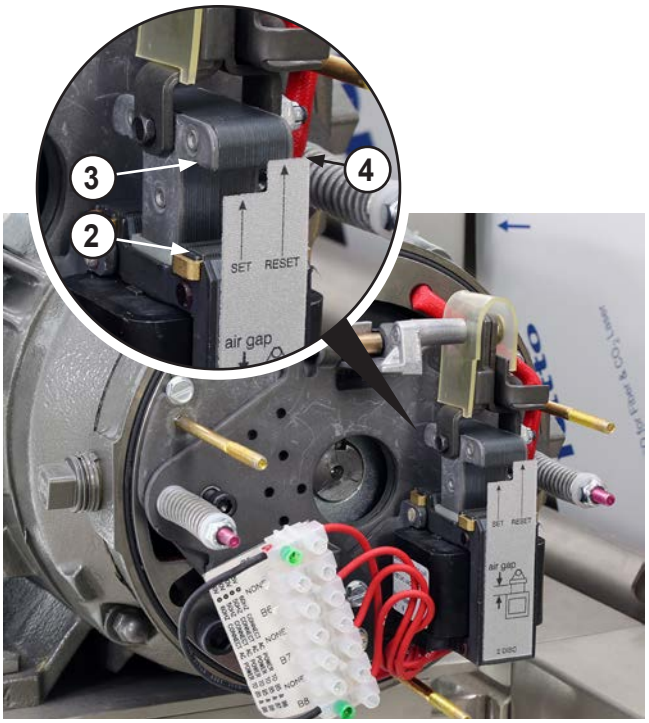
⚠ WARNING

According to the brake manufacturer, inhaling dust from inside the brake may be dangerous to your health. Do not disperse dust into the air or inhale dust! Do not use an air hose to blow off dust from the brake interior. Use a vacuum or brush to remove dust. Wear a mask or respirator. See additional warnings in the brake manufacturer's literature*.

⚠ WARNING

This machine contains voltages dangerous to life! Always lock out the power source before beginning any maintenance procedure.

The following tools are recommended:
0-300 inch-pound (0-34 newton meter) torque wrench
3/8", 5/16" and 3/16" hex wrenches
5/16" nut driver
1/4" screwdriver
8" adjustable wrench



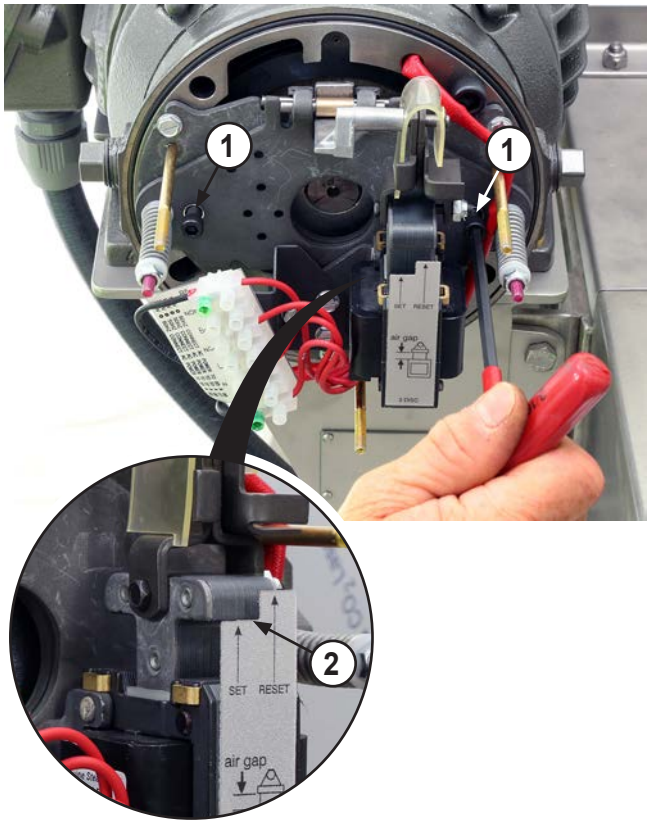
1. **Disconnect and lock out the power supply.**

2. **Remove the *housing (1)*.** Remove the three fasteners and slide the housing off of the studs.

3. **Check the air gap.** The air gap is the distance from the top of the ***solenoid frame (2)*** to the bottom of the ***plunger (3)***. If the bottom of the plunger is at or above the ***RESET (4)*** position on the air gap reset label, the brake requires adjustment. The air gap will increase as the friction discs wear.

* See the Stearns® website for additional safety information.
www.stearnsbrakes.com/files/90560_stearns_1056x00_series_all_revisions_manual_.aspx

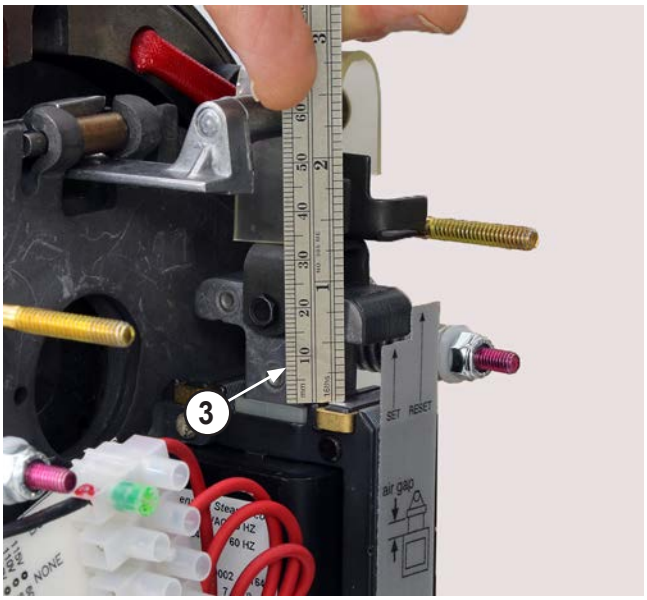
4. **Adjust the air gap.** Use a 3/16" hex wrench or flat screwdriver on older models. To decrease the air gap, turn both ***adjusting screws (1)*** clockwise. To increase the air gap, turn both screws counterclockwise. Turn the screws evenly, 1/8 turn, then manually depress the plunger. Recheck the air gap. Turn both screws evenly, 1/8 turn at a time, until the bottom of the plunger is at the ***SET position (2)*** on the air gap reset label.



5. **If the air gap reset label is missing, *measure (3)*** from the solenoid frame to the bottom of the plunger. If the gap measurement exceeds .69" (17.5 mm) or 11/16", adjust the air gap. Turn the adjusting screws and set the air gap to .45" (11.4 mm) or 29/64". This is the measurement at the SET position on the label.

NOTICE

Friction discs may need replacement. Discs must be replaced when worn to 3/32" or .093" (2.4 mm). See the following pages.



6. **Install the *housing (4)*.** Apply grease to the ***O-ring (5)*** in the end plate. Earlier brake models have a gasket instead of an O-ring; do not apply grease to the gasket. Place the end of the ***spring (6)*** on the right side of the hole in the housing. Install the housing and fasten with the three nuts; torque to 12-14 inch-pounds (1.4-1.6 newton meters).

7. **Test the brake.** See Testing the Brake on page S.3.

Replacing the Friction Discs

1. **Disconnect and lock out the power supply.** Remove the housing.

2. **Remove the *support plate assembly (1)*.** Three screws hold the assembly in place. The wires to the solenoid coil can remain attached. Support the assembly so that wires are not damaged; see the middle photo to the right.

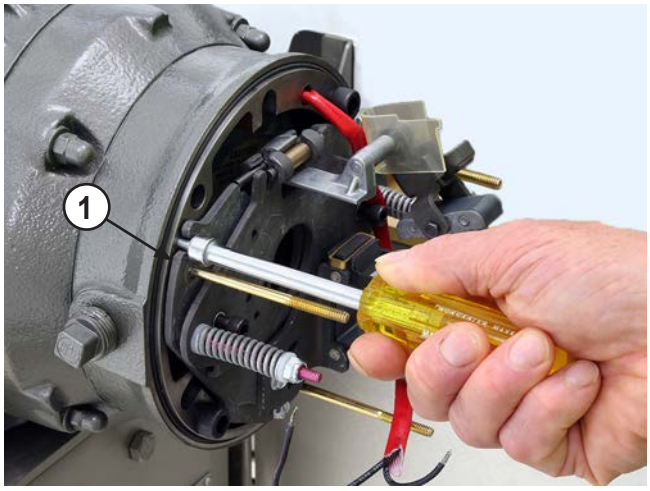
3. **Remove the *stationary discs (2)* and *friction discs (3)*.** The 10 pound-foot brake has two friction discs and two stationary discs. Replace friction discs when they are worn to one half the original thickness or .093" (2.4 mm), or 3/32". Discard worn discs.

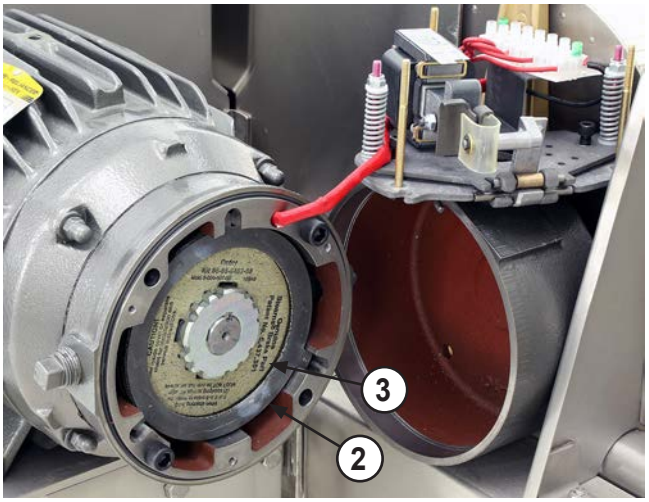
4. **Install the stationary discs and new friction discs.** The ***springs (4)*** on the stationary discs face inward. Alternate discs beginning with a friction disc as shown.

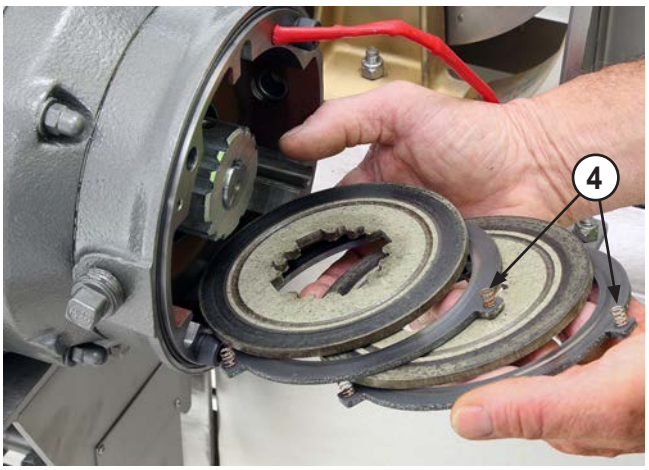
5. **Install the support plate assembly** on the end plate and tighten screws to 55-58 inch-pounds. (6.2-6.6 newton meters).

6. **Check the air gap.** See Adjusting the Brake on page S.4.

7. **Test the brake.** See Testing the Brake on page S.3.

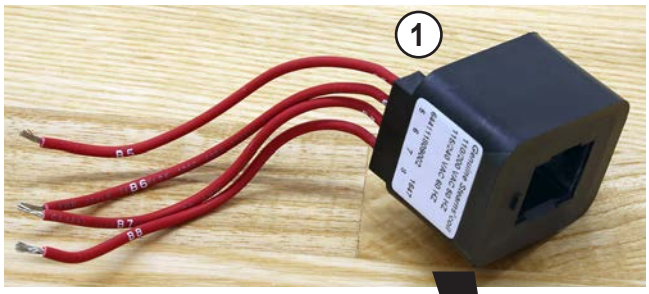


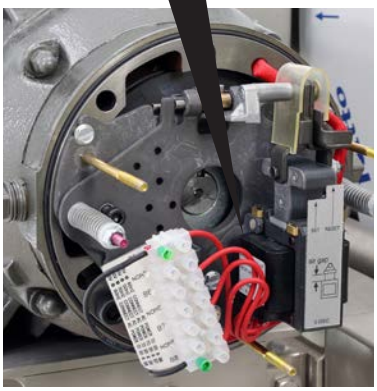


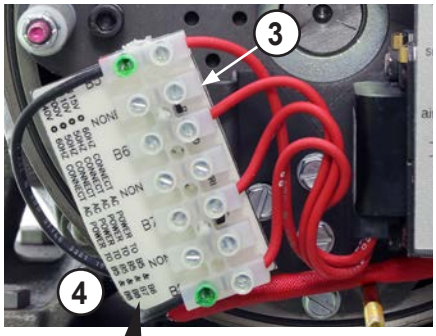


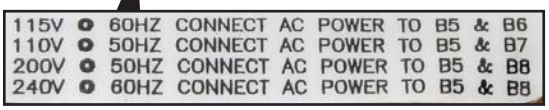
Replacing the Solenoid Coil

The ***solenoid coil (1)*** used in the 10 pound-foot brake on a standard machine is a multiple voltage and dual frequency coil with four leads* (also called a quad coil). For a machine with direct-on-line starting, power is supplied to the coil from the motor windings. For a machine with a ***variable frequency drive (2)***, power is supplied to the coil from the transformer in the electrical enclosure. See the chart below. The coil leads must be correctly connected to the ***terminal strip (3)*** based on the supplied voltage. See the ***label (4)*** below the terminal strip.









Solenoid Coil, Multiple Voltage			
Brake Motor Starting Method	**Power Source for Coil**	**Voltage to Coil**	**Frequency**
DOL*	Motor Windings	200-240	50/60
VFD**	Transformer	110-115	50/60
* Direct-On-Line ** Variable Frequency Drive			

A 200-240 volt dual frequency coil with three leads was supplied on earlier machines. This coil can be replaced by the multiple voltage coil described above in most installations. The 200-240 volt coil can be used when voltage is greater than 240 volts at the coil. See the following pages and parts information at the end of this supplement. Note that non-standard machines may require a different coil.

NOTICE

An incorrect supply voltage will cause the coil to fail prematurely. Incoming voltage must be within +/-5% of the voltage specified by the label on the electrical enclosure.

(continued on the following page)

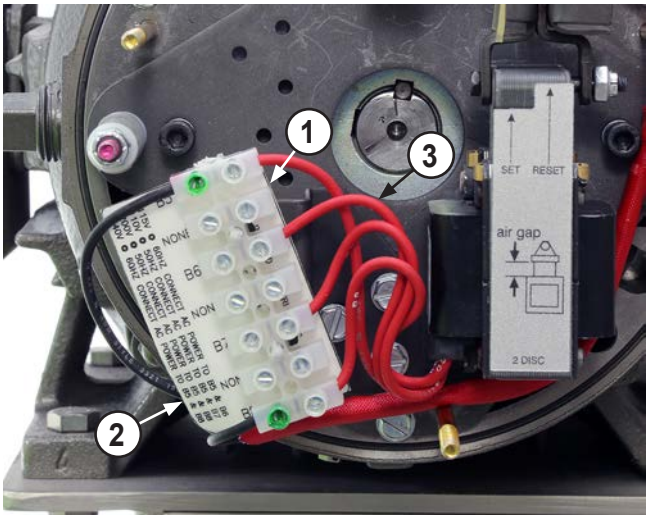
* Machines sold in Canada use a 575 volt coil; see the parts list at the end of this supplement.

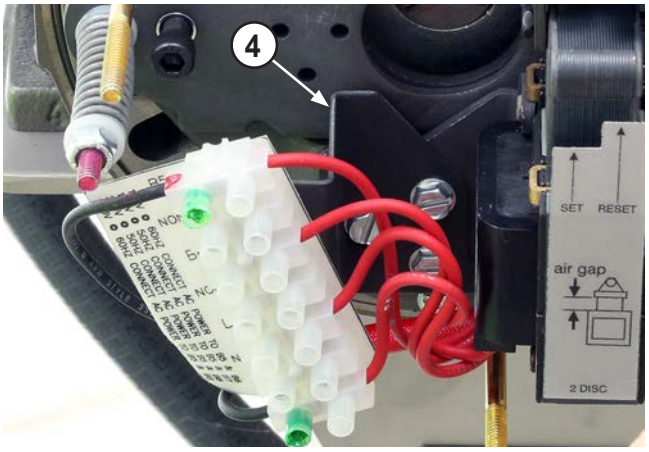
Replacing the Solenoid Coil, continued

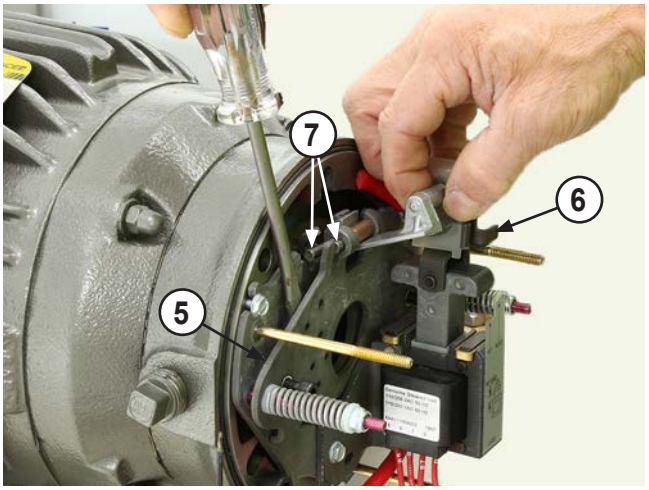
1. **Disconnect and lock out the power supply.** Remove the housing.

2. **Check the wires in the *terminal strip (1)*.** See the ***label (2)*** and verify that wires are properly connected and labeled. Remove the ***coil leads (3)*** from the terminal strip, then remove the ***terminal bracket (4)*** (the bracket must be removed to remove the coil). The wires from the motor can remain attached to the terminal strip. Support the bracket so the cable from the motor is not damaged.

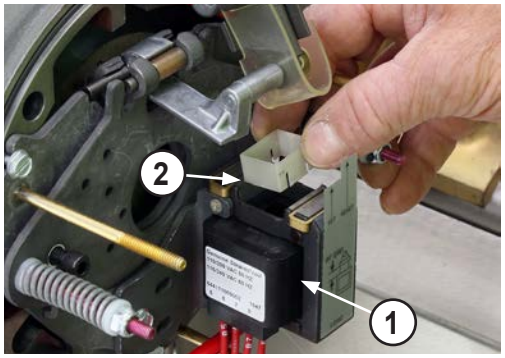
3. **Insert a screwdriver between the support plate and the *lever arm (5)*.** Pry the lever arm outward and lift the ***plunger and solenoid lever assembly (6)*** out of the coil. Pull out on the assembly while lifting so the ***pins (7)*** are not dislodged.



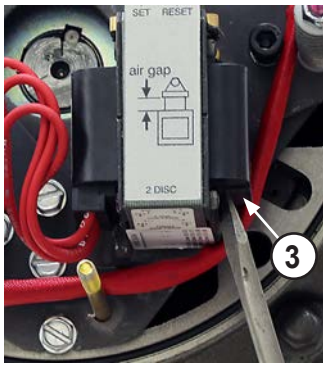


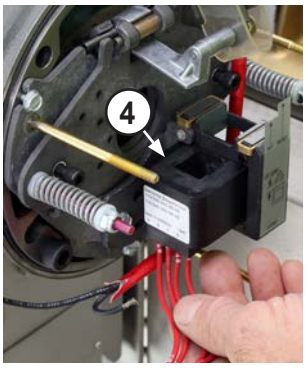


4. **Replace the *coil (1)*.** Remove the ***plunger guide (2)***. Use a screwdriver to push up on the ***catch (3)*** on the bottom of the coil. Slide the coil out of the ***frame (4)*** and discard. Install the new coil and plunger guide.



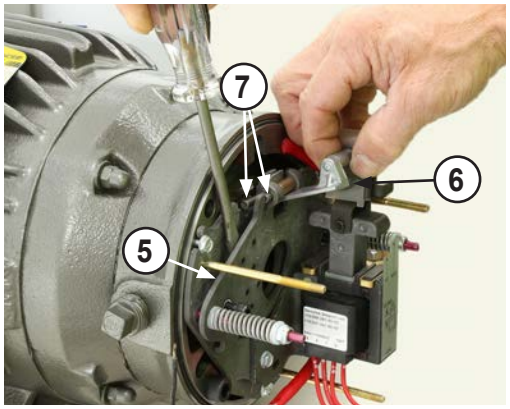
5. **Insert the plunger into the coil.** Use a screwdriver to pry the ***lever arm (5)*** outward. Pull out on the ***plunger and solenoid lever assembly (6)*** as the plunger is inserted into the coil. Make sure the ***pins (7)*** remain in the proper locations.

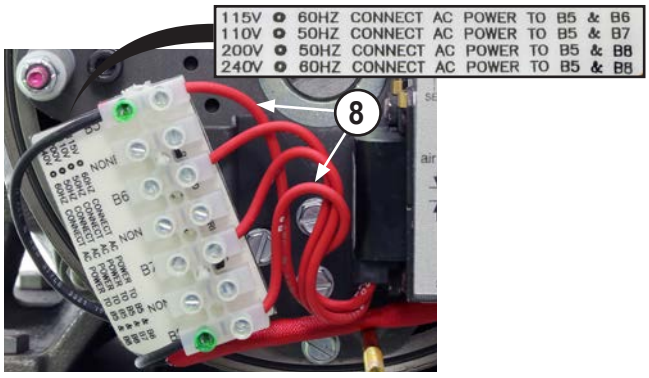




6. **Install the terminal bracket and coil leads.** Install the numbered ***coil wires (8)*** into the corresponding terminal locations. Wire numbers B5, B6, B7 and B8 are printed on the wire insulation. Install the unused wires in the terminal strip to properly terminate the wires. The motor leads are typically labeled B1 and B2. Position the wires or cable coming from the motor away from moving parts. Moving parts can cause damage from rubbing and pinching the cable.

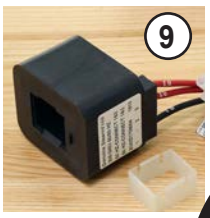
   The ***200-240 volt coil (9)*** used in earlier brakes has three leads. This coil is only used for motors with direct-on-line starting. Wire numbers B1, B2 and B3 are printed on the wire insulation. A terminal strip and label for a three lead coil is shown in the photo. See the parts list at the end of this supplement. Install wires as shown on the label.

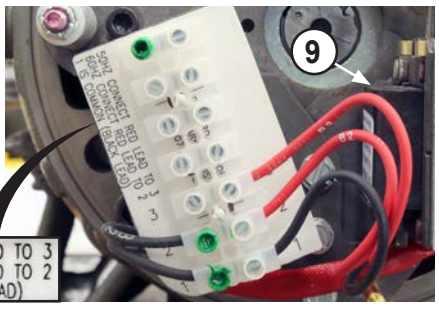




7. **Check the air gap.** See Adjusting the Brake on page S.4.

8. **Test the brake.** See Testing the Brake on page S.3.





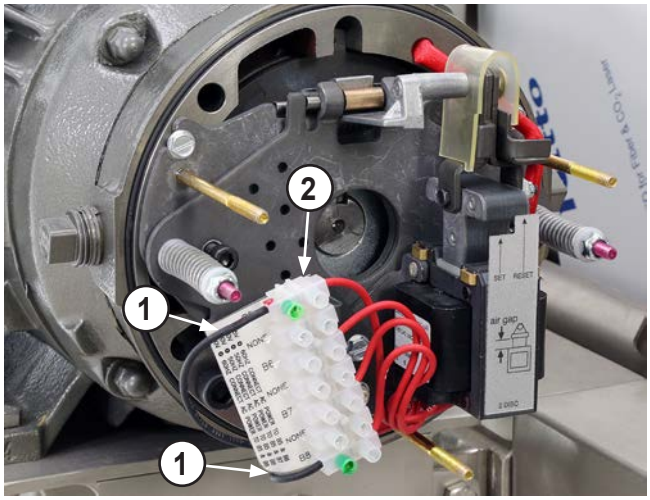
Replacing the Brake Assembly

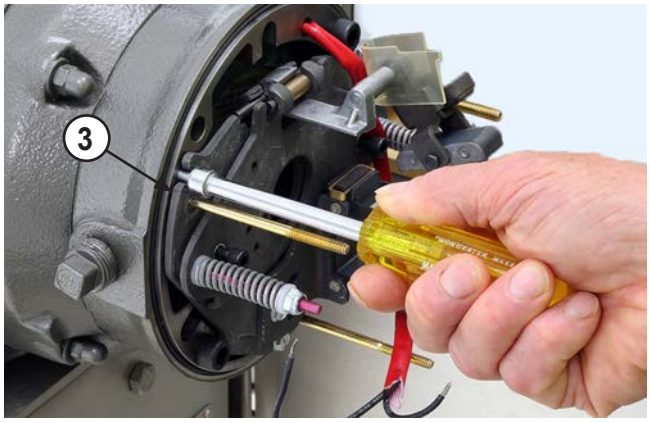
Check the power requirements and verify the voltage before ordering a brake assembly.

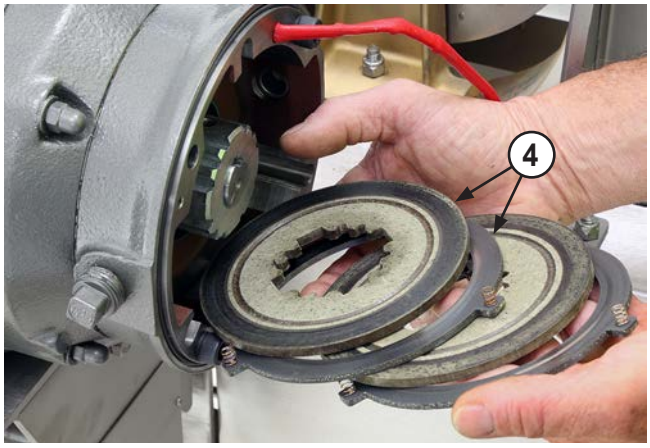
1. **Disconnect and lock out the power supply.**

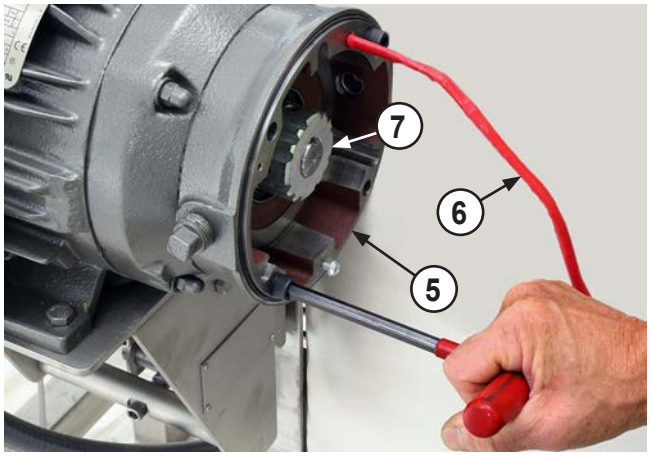
2. **Remove the brake assembly.** Remove the housing. Check the ***wires (1)*** at the terminals and verify that the markings on the insulation are legible. If markings cannot be read, wrap tape around the wire and write the terminal number with a permanent marker. Disconnect the wires from the ***terminal strip (2)***.

   Remove the ***support plate assembly (3)*** and the ***stationary and friction discs (4)***. Remove the fasteners that hold the ***end plate (5)*** and carefully pull the ***cord (6)*** or wires through the end plate while removing. Some brakes have a cord connector in the end plate; remove the connector. Loosen the set screws and remove the ***hub (7)***.

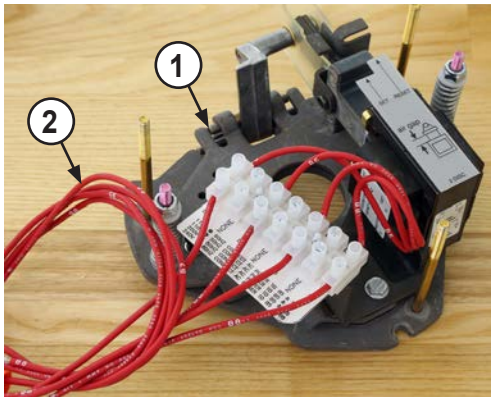






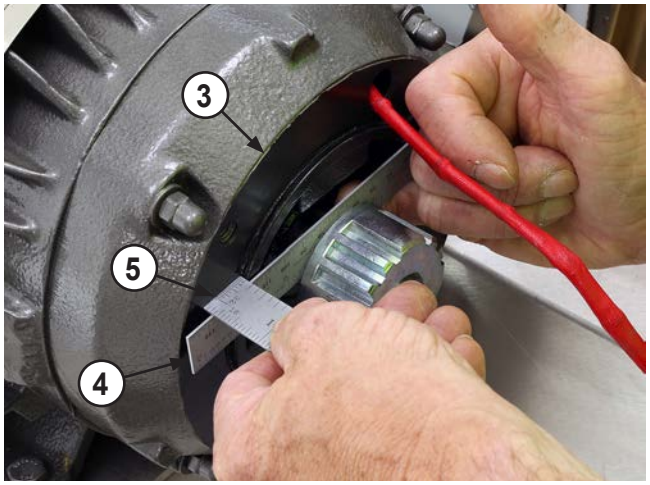


3. **Disassemble the new brake assembly.** Remove the housing from the brake assembly. Remove the ***support plate assembly (1)***. Push the hub out of the end plate. If ***additional wires (2)*** are included at the terminal strip, remove the wires and discard.



4. **Install the hub and key on the motor shaft.** The back of the hub must by 3/16" (4.8 mm) from the ***brake mounting surface (3)*** on the motor. Hold a ***steel scale (4)*** or similar tool against the back of the hub to use as a straight edge. Use a ***scale (5)*** to measure from the motor to the outside surface of the straight edge. Move the hub on the shaft to the 3/16" measurement and tighten the set screws. Torque the set screws to 156-165 inch-pounds (17.6-18.6 newton meters).

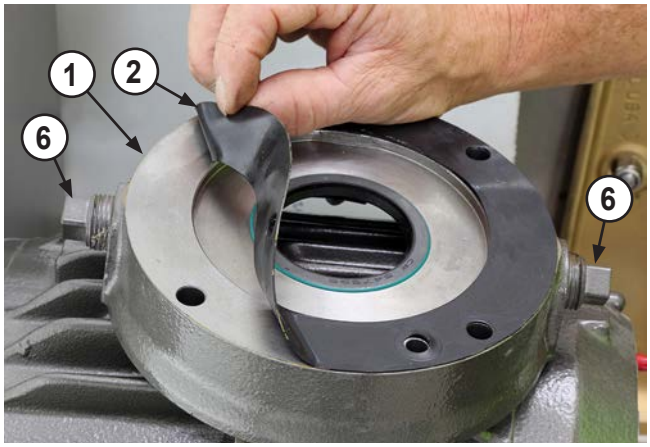
(continued on the following page)

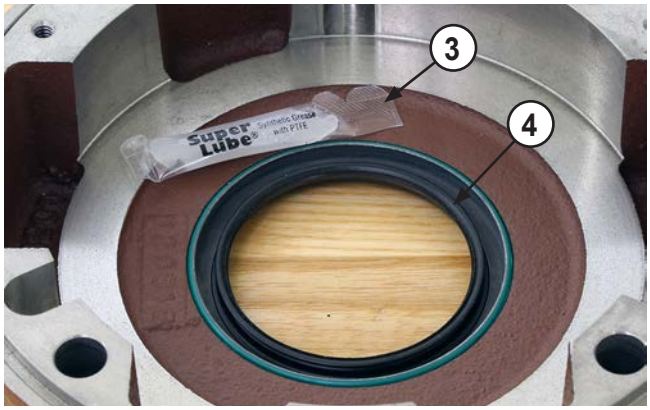


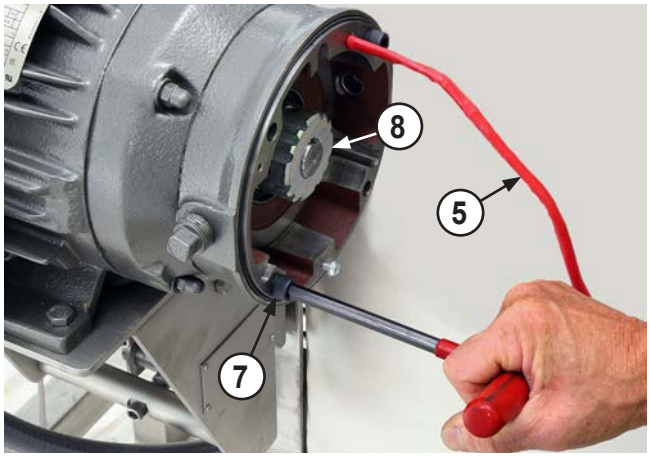
Replacing the Brake Assembly, continued

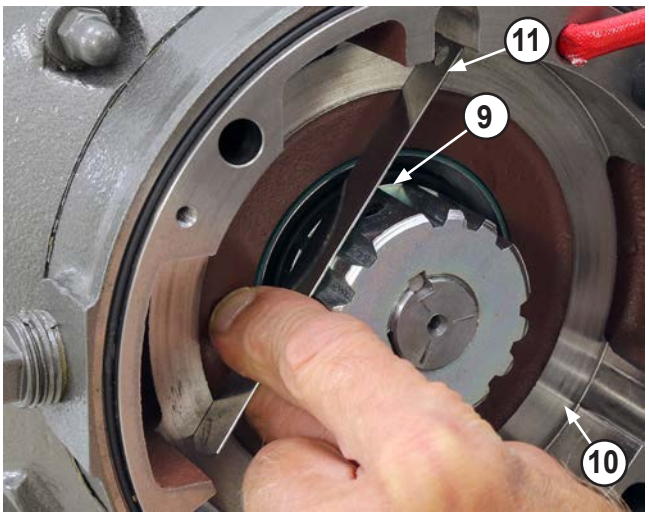
5. **Install the *end plate (1)*.** Check that the ***gasket (2)*** is in place. Apply the ***grease (3)*** supplied with the brake to the ***seal lip (4)***. Install the ***cable (5)*** or wires from the back of the motor through the hole in the end plate. Some brakes have a cord connector in the end plate. Remove the appropriate ***pipe plug (6)*** and install the connector. Use the two ***socket head screws (7)*** to attach the end plate. Torque the screws to 180-240 inch-pounds (20.3-27.1 newton meters).

6. **Check the location of the *hub (8)* on the shaft.** The bottom of the ***spline grooves (9)*** must be lower than the ***friction surface (10)*** on the end plate. Use a ***straight edge (11)*** to check. If the hub is too far out on the shaft, the friction disc cannot make contact with the friction surface.









7. **Install the *stationary discs (1)* and *friction discs (2)*.** The ***springs (3)*** on the stationary discs face inward. Alternate discs beginning with a friction disc as shown. To check for proper contact of the friction surfaces, push in on the discs and attempt to rotate the hub; the hub should not rotate.

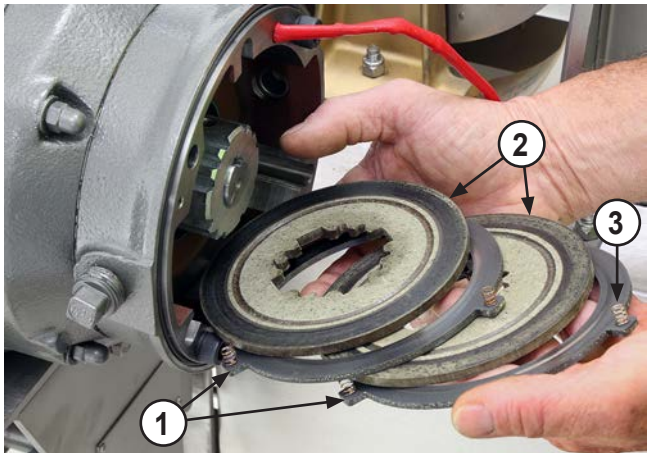
8. **Install the *support plate assembly (4)*** on the end plate and tighten the three ***screws (5)*** to 55-58 inch-pounds (6.2-6.6 newton meters).

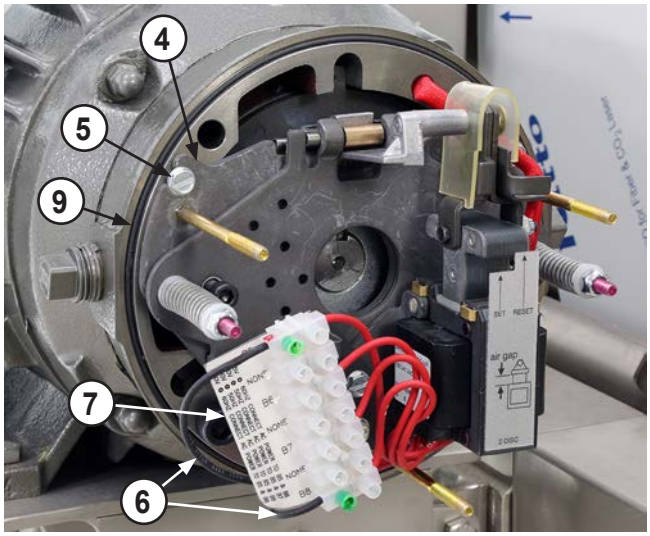
9. **Install the *wires (6)* from the motor onto the terminal strip.** Refer to the ***label (7)*** on the terminal strip. Position the wires or cable coming from the motor away from moving parts. Moving parts can cause damage from rubbing and pinching the cable.

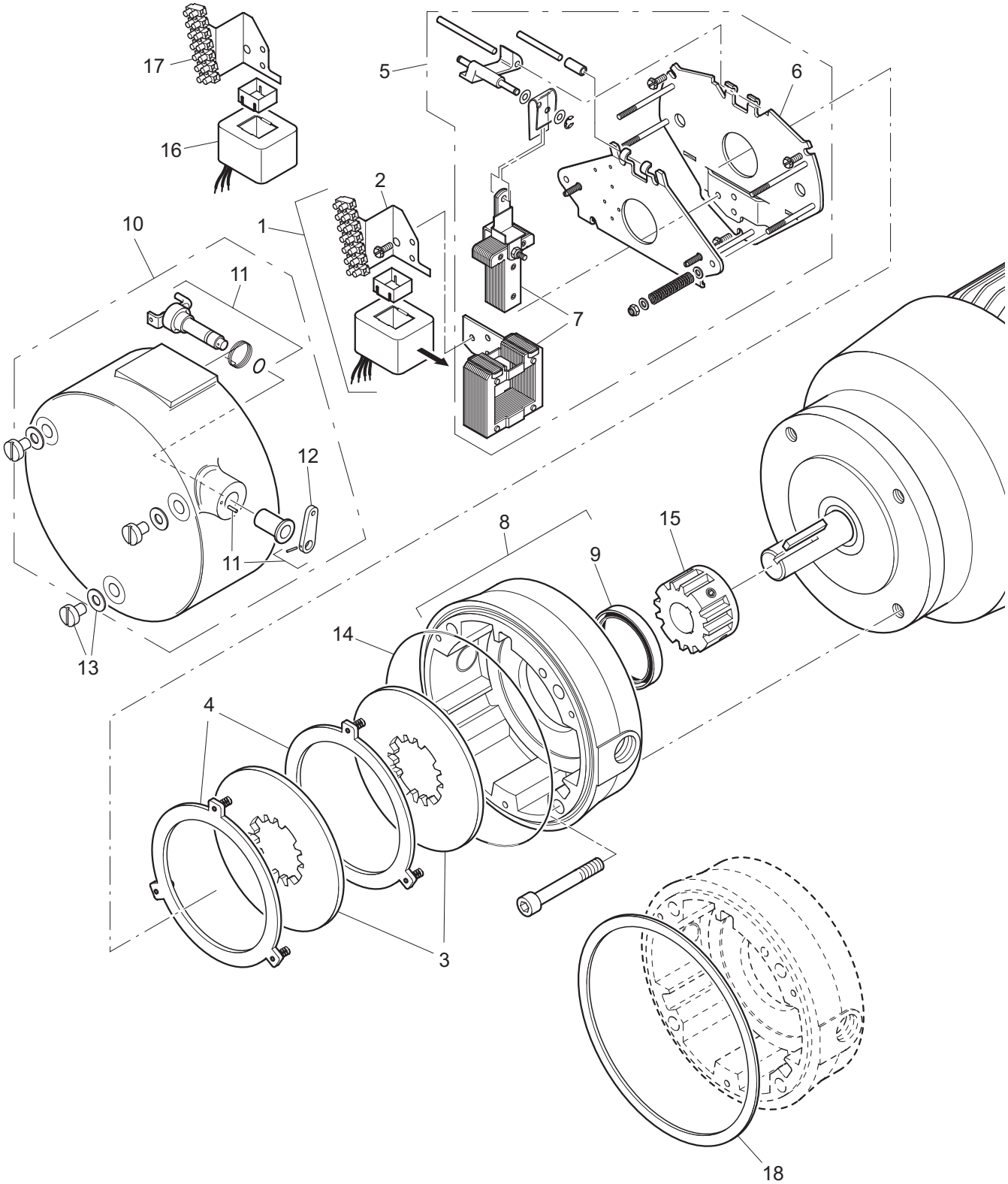
10. **Check the air gap.** See Adjusting the Brake on page S.4.

11. **Install the *housing (8)*.** Apply grease to the ***O-ring (9)*** in the end plate. Earlier brake models have a gasket instead of an O-ring; do not apply grease to the gasket. Position the ***spring (10)*** on the right side of the fastener hole. Install the housing and fasten with the three nuts; torque to 12-14 inch-pounds (1.4-1.6 newton meters).

12. **Test the brake.** See Testing the Brake on page S.3.






17
16
5
6
2
1
10
11
7
12
11
8
15
9
14
13
4
3
18

Item	Quantity	Part Number and Description

Stearns 56200 REV C brake assembly (IP-56 rated) for 2, 3 and 5 hp (1.5, 2.2 and 3.7 kW) motors

–	1	**21818*** - Brake Assembly, 10 pound foot, dual voltage/frequency, 56200 (includes items 1–15)
1	1	**21677** - K4 Solenoid Coil, 110-240 volts (includes item 2)
2	1	**21983** - Terminal Kit, Stearns 56200 brake, quad voltage
3	2	**12890** - Friction Disc, Stearns 56200 brake
4	1	**12891** - Stationary Disc Kit, Stearns 56200 brake
5	1	**12892** - Support Plate Assembly, 10 pound foot, Stearns 56200 (includes items 6-7)
6	1	**12903** - Support Plate and Spring Stud Assembly, 56200
7	1	**12904** - Plunger, Link and Frame Assembly, 56200 brake
8	1	**12893** - Endplate and Seal Assembly, Stearns 56200 brake (includes item 8)
9	1	**12906** - Seal for Endplate, Stearns 56200 brake
10	1	**12894** - Housing and Release Assembly, Stearns 56200 brake (includes items 11-12)
11	1	**12910** - Manual Release Assembly, 56200 brake (includes item 12)
12	1	**12913** - Handle, manual release, s.s., 56200 brake
13	1	**12911** - Housing Nuts and Gaskets, 56200 brake (includes 3 nuts and 3 gaskets)
14	1	**21418** - O-ring, brake housing, IP-56
15	1	**12895** - Hub and Set Screw Assembly, 7/8” bore, Stearns 56200 brake

Solenoid coil used in machines sold prior to 2012 and for voltage greater than 240 volts at the coil, direct-on-line (DOL) starting only

16	1	**12885** - K4 Solenoid Coil, 200-240 volts (3 lead coil, includes plunger guide, replaces item 1)
17	1	**12909** - Terminal Kit, Stearns 56200 brake, dual frequency (use with 3 lead coil, replaces item 2)

Stearns 56200 rev C brake assembly, 575 volt

–	1	**12899** - Brake Assembly, 10 pound foot, with 575 volt coil, 56200 (includes items 2–15 above and coil below)
–	1	**12886** - K4 Solenoid Coil, 575 volts (not shown)

Gasket for the following Stearns 56200 brakes (IP-55 rated): Original (pre-revision), Rev A and Rev B models

18	1	**12905** - Gasket, housing and endplate, 56200 brake (use in place of item 13)

* Check the diameter of the motor shaft at the brake end before ordering. This brake is for use with a 7/8" diameter shaft.

See ordering information on the following page.

Ordering Parts

Include the following information when ordering parts:

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

See the machine manual for the location of the serial number plate. Do not use the item numbers on the illustrations when ordering parts.

Customers in the U.S.A.: Orders are accepted by mail, telephone, facsimile and email.

Urschel Laboratories, Inc.
1200 Cutting Edge Drive
Chesterton, Indiana 46304 U.S.A.

Telephone: 219-464-4811
Toll free: 844-877-2435
Facsimile: 219-462-3879
Email: orders@urschel.com

Customers outside the U.S.A.: Contact your nearest Urschel representative. Urschel has parts inventories in several regions around the world. Visit the website at www.urschel.com for the address of the nearest representative.

Contact Information

Contact your Urschel representative if there are any questions regarding safe operation and servicing your machine. Contact information and locations of Urschel representatives are available on the website. You can also email or call the Service Department at Urschel:

Website: www.urschel.com
Email: ServiceDept@urschel.com
Telephone: 219-464-4811
Toll free: 844-877-2435

Ordering an Instruction Manual

To obtain an instruction manual, visit the company website, email the Technical Publications Department or call the company or your Urschel representative:

Website:
www.urschel.com/technical-publications/
Email: techpubs@urschel.com
Telephone: 219-464-4811
Toll free: 844-877-2435

If emailing or calling, please include:

- **Machine Model and Serial Number**
- **Company Name and Address**
- **Language Required**
- **Format: file download, USB flash drive or printed**

USB flash drives and printed manuals are sent free of charge and postage paid.

The addendum is placed in the front of the manual to alert the user to revisions in the manual's contents. Addendum page numbers have an "A" prefix.

Model CC-D
Addendum to manual L1798
Publication Description: ADDENDUM TO L1798, ENGLISH, MCCD (SS L3104)
Publication Number: **L3290**
Date issued: May 2019
Supersedes publication L3104

URSCHEL
CORPORATE HEADQUARTERS
1200 Cutting Edge Drive
Chesterton, Indiana 46304 U.S.A.
Corporate: +1.219.464.4811 Fax: +1.219.462.3879
Toll Free: +1.844.URSCHEL (877.2435)
www.urschel.com
Technical Publication inquiries: techpubs@urschel.com
Other inquiries: info@urschel.com

Manual Page Number	Revision
14-17	Safety Switch, Amplifier, Safety Switch System Test: A ***safety monitor (1)*** is supplied with the current electrical assembly. See the entries for pages 61-64 for more information on changes to the electrical system. The testing procedure has not changed.
20	General Information, Specifications: The second sentence of the first paragraph no longer applies.

Locations of Sensor Leads on the Safety Monitor

Switch Number	1	2	3
Guard	Feed Hopper	Discharge Chute	Frame Cover
Switch Input	IN1	IN2	IN3

Manual Page Number	Revision
22-24	General Information, Size and Types of Cuts:

The Model CC-D can be equipped with the following cutting head assemblies.

***Grating head assemblies (1)*:** Described in the supplemental publication L2532.

Flat-V® head assemblies (2)*:** These assemblies produce two types of shreds. ***Full Flat-V shreds (3) have a hexagonal cross section, measuring approximately .150" (3.81 mm) on all sides. ***Reduced Flat-V shreds (4)*** have flattened tops and bottoms, forming a corrugated shred.

Flat-V heads are described in the supplemental publication L2534.

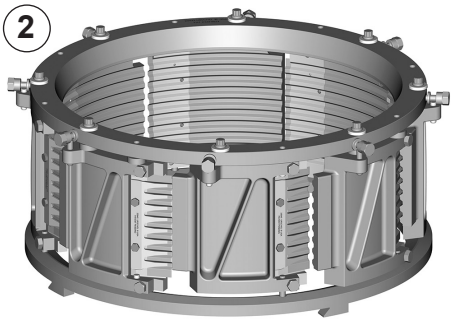
NOTICE

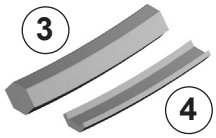
Flat-V head assemblies are not available in some European countries. Contact your Urschel representative for information on availability in your country.

***.480" crinkle cut head assemblies (5)*:** Described in the supplemental publication L2709.

NOTICE

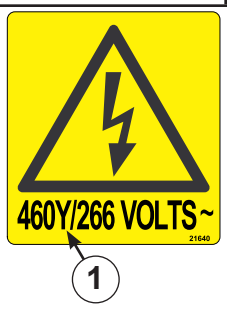
If supplements are not included, contact your Urschel representative.





Manual Page Number	Revision

28-29 Installation, Electrical Power: Add the following to step 1.



A ***"Y" (1)*** in the voltage designation indicates that the machine requires a Wye power supply and is equipped with mini circuit breakers (MCBs).

To check for a Wye power supply:

Calculate the voltage to ground. Multiply the power supply voltage by .577 (supply voltage x .577 = voltage to ground). Measure the voltage to ground at each phase and compare to the calculated value.

For example, at 400 volts, a Wye power supply will measure approximately 231 volts from one phase to ground (400 x .577 = 231). One phase may measure 0 volts, which is acceptable. A delta supply at 400 volts will measure 400 volts from each phase to ground, and should not be used if a Wye power supply is designated.

NOTICE

If the machine requires a Wye power supply ("Y" in the label, see above) and the voltage from one phase to ground exceeds 277 volts, contact an Urschel service representative.

38 Maintenance, Cleaning:

Cleaning the Machine and Parts Before Use

Parts and equipment supplied by Urschel have not been sanitized. Urschel recommends that the supplied parts and equipment be properly cleaned and sanitized prior to use in accordance with the requirements of the application.

40 Maintenance, Lubrication, Recommended Lubricant: Keystone KLC-20 oil is replaced by:

25641 - Urschelube, FDA, ISO 100, 5 gallons.

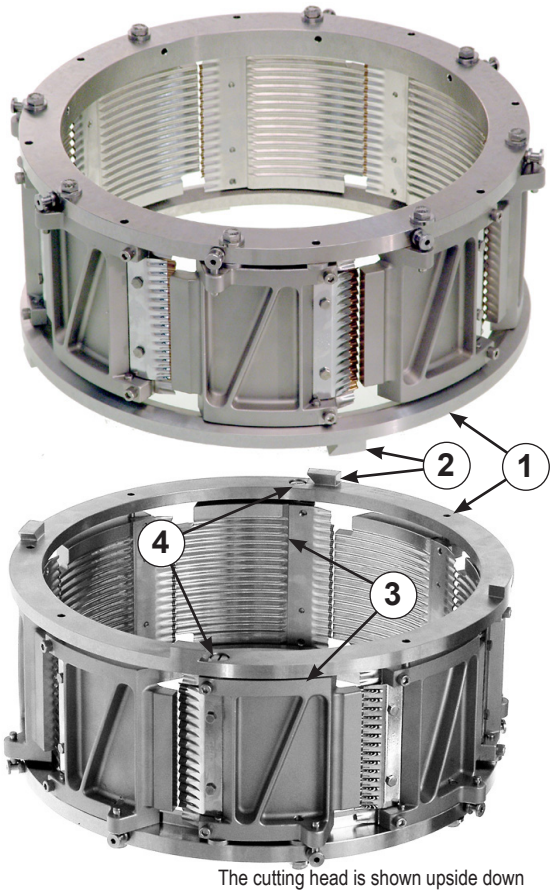
Manual Page Number	Revision

42-49 Maintenance, Cutting Unit:

Cutting heads with a ***locking support adapter (1)*** are available for this machine. These heads are referred to as double ring heads, and must be used with the locking cutting head support (see the entry for pages 78-79).

To remove the head from the machine, rotate counterclockwise until the ***locking tabs (2)*** are disengaged. Then lift the head from the support.

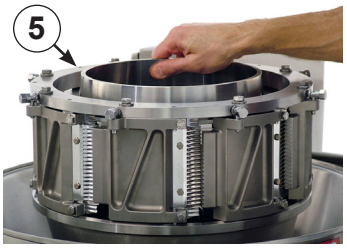
The head is serviced in the same manner as single ring heads. ***Adapter shoes (3)*** are installed on opposite sides of the head. After maintenance and adjustments are complete, align the support adapter with the pins in the bottom of the shoes and install the ***fasteners (4)***.



The cutting head is shown upside down

43 Maintenance, Cutting Unit, Reassembly:

Check for contact in the cutting parts after maintenance is complete. Switch the motor brake to the release position. Grip the impeller along the top as shown. Slowly rotate the ***impeller (5)*** backwards, checking for metal-to-metal contact. Any contact must be corrected before operating the machine.



⚠ WARNING

Contact with the cutting parts can cause personal injury. Do not reach inside the impeller. Grip the impeller along the top as shown.

50-60 Maintenance, Impeller Drive Assembly: When fastening the horizontal bearing housing to the gear case, use part number **10058** - Hex Head Cap Screw, 3/8-16 x 1” (quantity of 6).

When fastening the impeller housing to the gear case, use part number **10100** - Socket Head Cap Screw, 5/16-18 x 3/4” (quantity of 8). Tighten the 10100 screws to 30-37 foot pounds (41-45 newton meters).

Manual Page Number	Revision

50-60 Maintenance, Impeller Drive Assembly: Sealed impeller drive assemblies are now supplied on new machines. Add the following information.

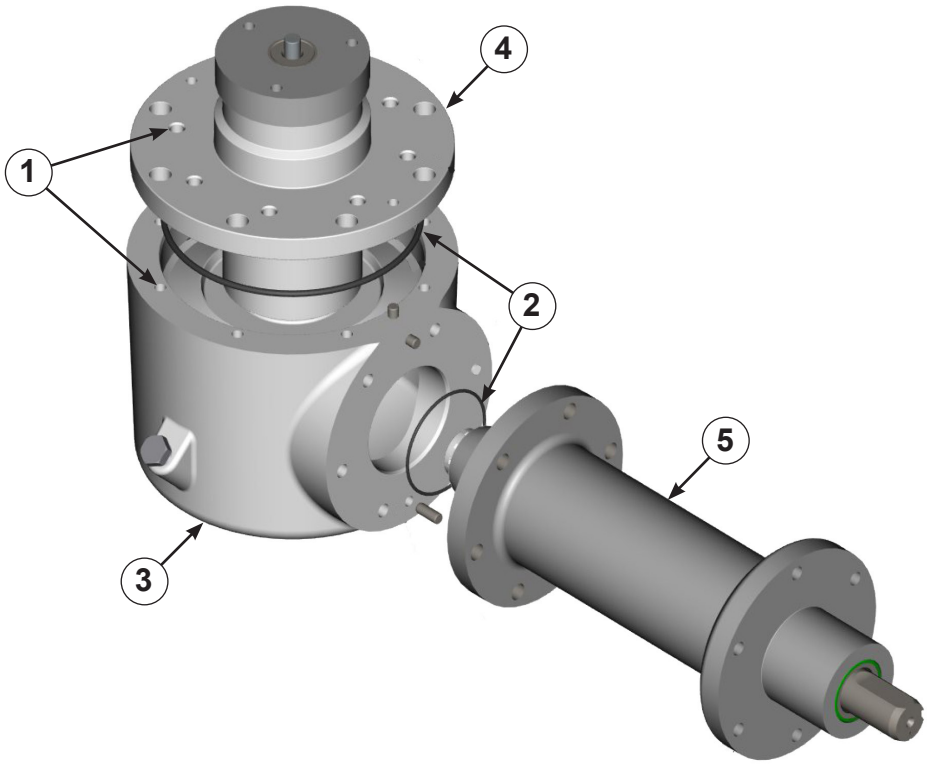
Urschel has developed new sealed impeller drive assemblies for the Model CC Series of machines. This includes the Models CC, CC-D, CC-DL, CCX-D.

The sealed assemblies use ***blind holes (1)*** to eliminate the entry of water and contaminants. (A blind hole does not extend completely through the wall of the part.) Sealed assemblies also contain ***O-rings (2)*** to help seal the assembly from external contaminants and form a barrier to oil and grease entering the food zone. These features may extend the life of the assembly and reduce maintenance cost. The impeller assembly includes:

Sealed Gear Case (3)
Sealed Impeller Bearing Housing (4)
Sealed Bearing Housing (5)

The previous bearing housings are compatible with the new gear case (part number 25713). However, the new bearing housings are not compatible with the previous gear case (part number 22554).

Effective January 2017, all Model CC series machines will come equipped with the sealed impeller drive assembly. Contact your Urschel representative for more information.



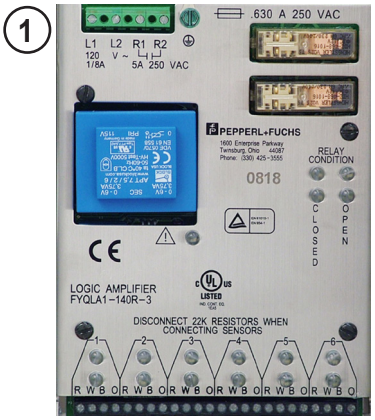
Manual Page Number	Revision
61	Maintenance, Electrical Assembly:

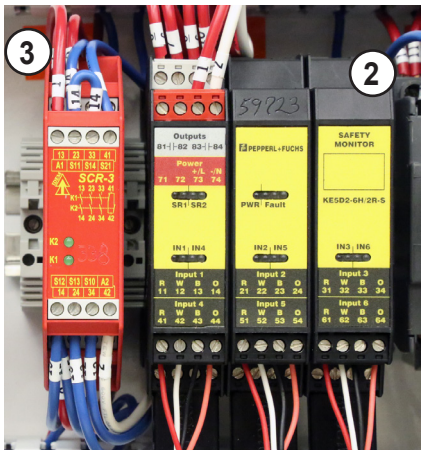
The electrical assembly was supplied with an ***amplifier (1)*** beginning in 1994 until 2013. The function of the amplifier is described in the Model CC-D manual L1798.

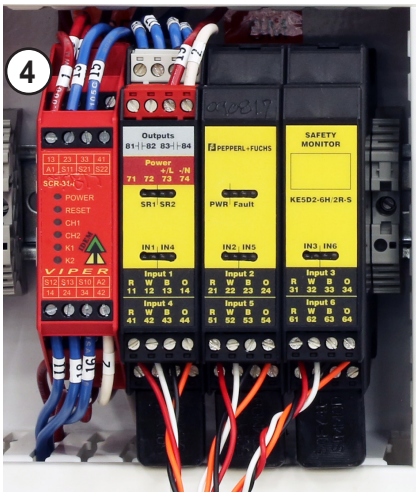
The electrical assembly was redesigned and new machines were supplied with a ***safety monitor (2)*** beginning in 2013. The monitor serves a function similar to that of the amplifier, but is not a direct replacement and is not interchangeable. See the next page and the entry for page 63 for more information on the safety monitor. The safety monitor is currently supplied with new machines.

The ***SCR-3 safety relay (3)*** was added to the electrical assembly in conjunction with the safety monitor. The safety relay monitors the motor contactor and the emergency stop button. The SCR-3 is no longer supplied with new machines. See the entries for pages 63-64 in this addendum for more information.

The ***SCR-31-i Viper safety relay (4)*** is currently supplied with new machines, beginning in 2017. The SCR-31-i Viper relay functions similarly to the SCR-3 relay, but is not a direct replacement and is not interchangeable. See the entries for pages 63-64 in this addendum for more information.







NOTICE

See the entries for pages 98-113 in this addendum and the parts section in the Model CC-D manual L1798 for the part numbers and part descriptions of the electrical components shown on this page. Previously supplied electrical components are available as repair parts unless otherwise noted in this addendum.

Manual Page Number	Revision

62 Maintenance, Electrical Assembly: The electrical assemblies is supplied with either mini circuit breakers or fuses.

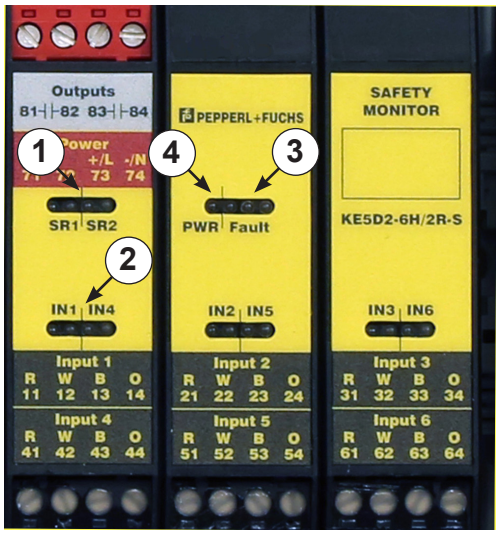
Inspection, Current Electrical Assemblies:

Mini circuit breakers (MCBs) and Fuses: The electrical enclosure is supplied with either mini circuit breakers or fuses. Mini circuit breakers are used with power supplies of 240 volts or less, and for Wye power supplies of 380-480 volts. Wye power supplies are the most common world wide.

See the entry for pages 28-29 to check for a Wye power supply. Reset tripped circuit breakers by switching them off and then back on. If circuit breakers trip frequently, investigate the cause.

Fuses are used for Delta power supplies of 380-460 volts, and for Wye power supplies of 575 volts. Fuses must be replaced when they fail. If fuses fail frequently, investigate the cause.

63 Maintenance, Electrical Assembly: A safety monitor is used in current electrical assemblies. Add the following information.



The safety monitor and safety switches incorporate self-diagnostic features to help identify the source of problems in the safety circuit. The monitor LEDs indicate the status of the safety system.

The ***relay status LEDs (1)*** are green when all safety circuits are closed (all guards are in place). If either or both of the relay status LEDs are red, one or more safety circuits are open.

The ***input status LEDs (2)*** are green when all safety circuits are closed. When a guard is removed, the input status LED corresponding to that switch turns red. This identifies the open safety circuit.

The ***Fault LEDs (3)*** flash red when the safety monitor detects a problem. If the Fault LEDs are flashing and none of the input status LEDs are red, reset the safety system. Turn the disconnect switch handle off (O), wait 5 seconds, and then turn the handle back on (I).

The green ***PWR LEDs (4)*** indicate that electrical power is supplied to the machine (the disconnect switch handle is on).

(continued on the following page)

Manual Page Number	Revision
63-64	Maintenance, Electrical Assembly: The SCR-31-i Viper safety relay is supplied with current electrical assemblies (see the entry for page 61). Add the following information.

Safety Relay LEDs (SCR-31-i Viper, currently used)

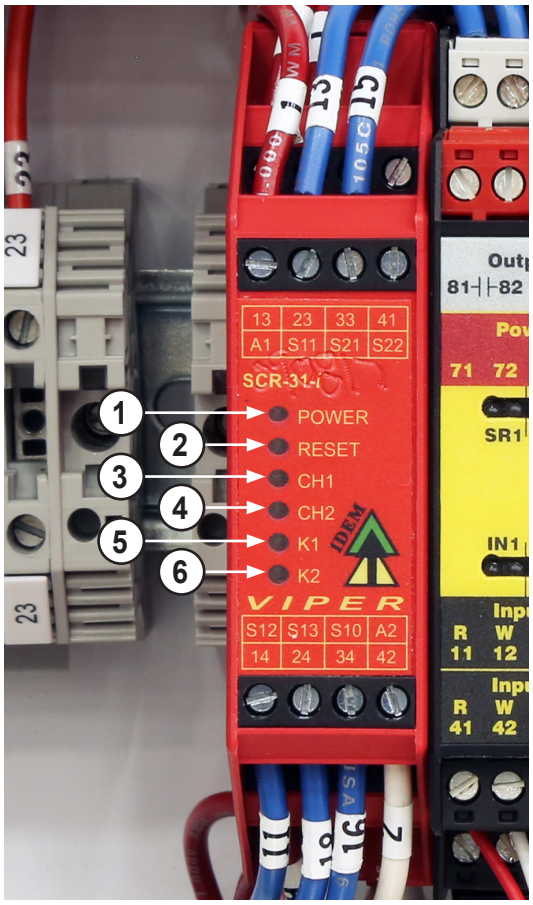
NOTICE

The SCR-31-i Viper safety relay is not interchangeable with the SCR-3 safety relay shown on the next page. See the entry for page 61 for more information on changes to the electrical system.

The safety relay currently in use is the SCR-31-i Viper. See the following page for information on the previous safety relay.

The safety relay includes the following LEDs. Various combinations of lit and unlit LEDs help to indicate the status of the safety system.

(1) Power
(2) Reset
(3) CH1
(4) CH2
(5) K1
(6) K2



The Power, CH1, CH2, K1 and K2 LEDs are lit: All guards are in place and the emergency stop button is reset. The machine is ready to start.

The Power and Reset LEDs are lit: A guard(s) has been removed or the emergency stop button has been pushed.

Only one of the K1 or K2 LEDs are lit: If both CH1 and CH2 are lit, but either the K1 or K2 LED is not lit, the safety relay has experienced a fault. Contact your Urschel service representative for further assistance.

Manual Page Number	Revision

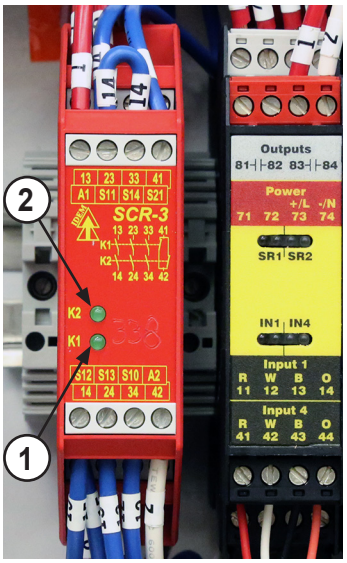
63-64 Maintenance, Electrical Assembly *(continued)*: A safety relay was supplied on previous electrical assemblies (see the entry for page 61). Add the following information.

Safety Relay LEDs (SCR-3, previously used)

NOTICE

The SCR-3 safety relay is not interchangeable with the SCR-31-i Viper relay that is shown on the previous page. See the entry for page 61 for more information on changes to the electrical system.

The safety relay previously used is the SCR-3. The safety relay includes the following LEDs. Various combinations of lit and unlit LEDs help to indicate the status of the safety system.



(1) K1
(2) K2

K1 and K2 LEDs are both lit: all input circuits for the safety relay are closed. The machine is ready to start.

Only K1 or K2 is lit: the circuit for that channel (K1 or K2) is interrupted. A fault exists and the machine will not start.

Both K1 and K2 are not lit: the circuit for both channels (K1 and K2) is interrupted. A fault exists and the machine will not start.

64 Maintenance, Electrical Assembly: The electrical enclosure as currently supplied uses a safety monitor (see the entries for the previous pages). The information below pertains to previous electrical assemblies only.

Inspection, Previous Electrical Assemblies:

Resistor and sensor leads: Check the connections for tightness [5.0 inch pounds (80 inch ounces), .56 newton meters]. Replacement amplifiers include dielectric grease, applicator brush, and instruction sheet (kit part number 12920). Apply the grease to the amplifier terminal and sensor leads after installation.

This page intentionally left blank.

Manual Page Number	Revision

72-73 Parts, Tools:

11029 - Wrench, box end, 1/2" x 9/16" is replaced by:
11010 - Wrench, combination, 9/16" chrome plate
98130* - Wrench, combination, 1/2" chrome plate

11047 - Wrench, box end, 7/16" x 1/2" is replaced by:
98131 - Wrench, combination, 7/16", chrome plate
98130* - Wrench, combination, 1/2", chrome plate

22174 - “C” Clamp, 1-1/4", for shipping is replaced by:
25632 - “C” Clamp, 2" for shipping

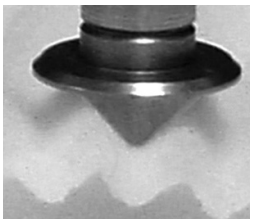
11069 - Grease Cartridge, Chevron FM® grease no. 2 is replaced by:
98287 - Grease, '2', Urschelube white FDA, cartridge

11045 - Grease, Haynes Lubrifilm is replaced by:
98283 - Grease, 1-1/2", Urschelube, clear FDA cartridge

23751 - Oil, 5 gallons, Royal Purple, food is replaced by:
25641 - Oil, Urschelube, FDA, ISO 100, 5 gallons

*Only one 98130 wrench is supplied with the machine.

A slice thickness gauge is available for V Cut and Crinkle slices. The anvil is shaped for use as shown to the right.
23154 - Slice Thickness Gauge, v-cuts and crinkle
23155 - Slice Thickness Gauge, v-cuts and crinkle, metric



Add the following to the Item 12 Setting Block chart:
22930 - Setting Block, for .280" (7.1 mm) flat slice

Add the following tool:
98163 - Screwdriver, flat head, 1/4" flat x 6"

Optional Tools

-	1	**25674** - Oil, Urschelube, FDA, ISO 100, 1 gallon
-	1	**17567** - Protective Glove, extra-small, one glove only
-	1	**17497** - Protective Glove, small, one glove only
-	1	**17453** - Protective Glove, medium, one glove only
-	1	**17498** - Protective Glove, large, one glove only
-	1	**17566** - Protective Glove, extra-small, one glove only

NOTICE

Protective gloves are available for use when handling or working near exposed cutting parts. Use according to the manufacturer’s instructions; see the label attached to the gloves.

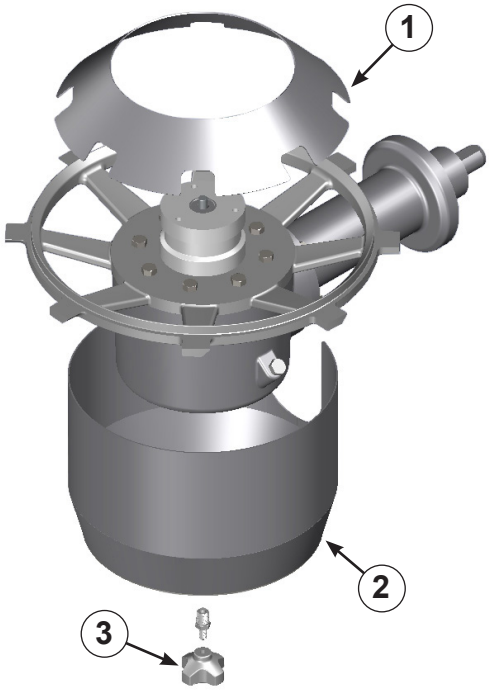
Manual Page Number	Revision

74-75 Parts, Frame, Covers and Guards: Kits are available to equip the Model CC-D with a larger discharge enclosure. The larger enclosure provides a wider discharge opening to help minimize product accumulation inside the enclosure. Kits are available for 26" and 32" (660 and 813 mm) diameter enclosures. Large enclosures are described in the supplemental publication L2356. Request this publication or contact your Urschel representative for more information.

Item 4, 22904 - Impeller Drive Shield is replaced by:
25746 - Cutting Head Support Shield (1) and
25747 - Impeller Drive Shield, polished (2)

The cutting head support and the impeller drive shield are designed to collect oil that may leak from the impeller drive assembly. This drive shield is fitted to the shape of the impeller drive, and helps prevent the accumulation of product inside the shield assembly.

The impeller drive shield is secured to the impeller drive assembly with the ***63825 - Hand Knob, 5/16-18 thread, s.s. (3)***.



The 22906 - Hand Knob with Stud, 5/16-18 (item 7) is replaced by:
19522 - Hand Knob, 5/16-18 stud

The 62052 - Hand Knob, 5/16-18 is replaced by:
63825 - Hand Knob, 5/16-18 thread, s.s.

76-77 Parts, Floor Stands and Alternate Feed Hoppers: The following are revisions and additional parts.

Item 3 in the illustration should be labeled **1**.
Item 11 in the parts list is not used.
The 22510 - Floor Stand, 39.44” discharge height, casters is no longer available for purchase.

Additional Parts

-	1	**23979** - Funnel Hopper with Grid Assembly
-	1	**23980** - Funnel Hopper Extension, conveyor feed assembly
-	1	**23981** - Funnel Hopper Extension, hand feed assembly
-	1	**23335** - Floor Stand, 39.44” (1001.80 mm) discharge height, 5+hp, casters

Manual Page Number	Revision

78-79 Parts, Impeller Drive Assembly (Stainless Steel):

Item 24, 22053 - Shaft, impeller, is replaced by:
23498 - Shaft, drive

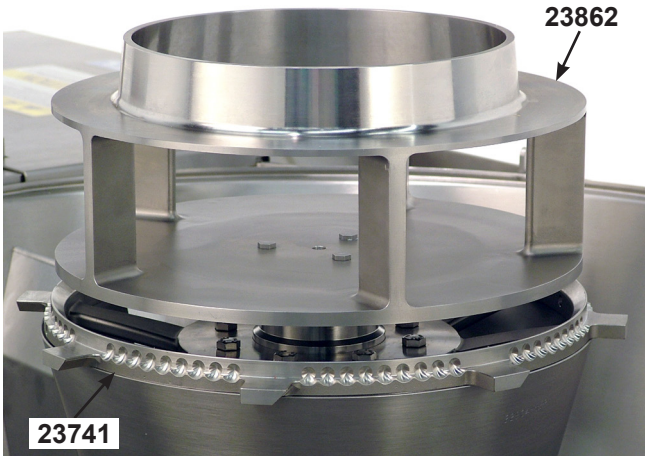
Item 25, 22277 - Key, is replaced by:
23499 - Key, 1/4" x 1/4" x 1-5/8". The 23498 shaft includes the 23499 key, and can be used as a replacement part for previous impeller drive assemblies. This change replaces the 22277 woodruff key with a square key.

The 22058 - Seal is replaced by:
23856 - Seal, horizontal input shaft

The 22034 - Pinion Gear Key is replaced by:
25685 - Key, 1/8" x 3/16" x 3/4", hardened

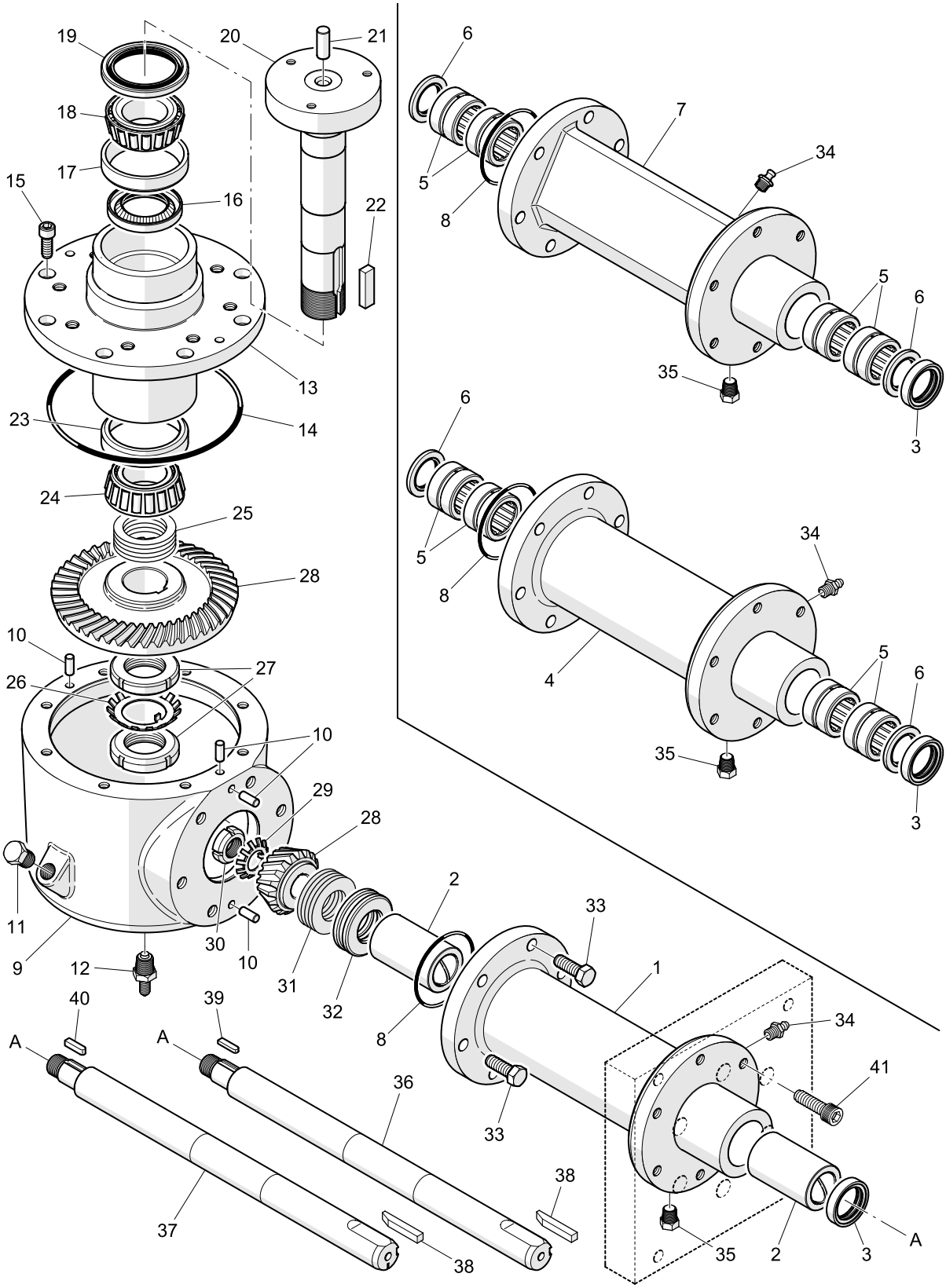
Additional Parts

-	1	**23177** - Impeller, 5 paddle, 13.736 O.D., balanced, s.s., CC-D (use with the 23356 head assembly for 1/2" slice)
-	1	**23932** - Impeller, 5 paddle, 13.906 O.D., balanced, s.s., CC-D (use with grating head assemblies)
-	1	**23356** - Head Assembly, slice, flat, 1/2", s.s., gateless, single adjustment, double ring; for 1/2" slice, (use with 23741 cutting head support, locking)
-	1	**23862** - Impeller, 5 paddle, 13.848 O.D., balanced, s.s., CC-D
-	1	**23741** - Cutting Head Support, locking, s.s., CC



Manual Page Number	Revision

78-79 Parts, Impeller Drive Assembly (Stainless Steel): Sealed impeller drive assemblies are now available. See the entry for pages 50-60 for more information.



Impeller Drive Assembly	Bearing Housing			Bearings or Bushings			Seals		
Part Number and Description	Item	Qty.	Part Number and Description	Item	Qty.	Part No. and Descrip.	Item	Qty.	Part No.
25717 - Impeller Drive Assembly, s.s., round, with bushings, sealed	1	1	**25694** - Bearing Housing, s.s., round with bushings, o-ring	2	2	**22427** - Bushing, 1.00 x 1.50 x 2.50"	3	1	**22045**
25718 - Impeller Drive Assembly, s.s., round, roller bearings, sealed	4	1	**25695** - Bearing Housing, s.s., round with roller bearings, o-ring	5	4	**22399** - Roller Bearing	3 6	1 2	**22045** **23856**
25719 - Impeller Drive Assembly, s.s., angled, roller bearings, sealed	7	1	**25711** - Bearing Housing, s.s., angled with roller bearings, o-ring	5	4	**22399** - Roller Bearing	3 6	1 2	**22045** **23856**
25739 - Impeller Drive Assy., s.s., round, roller bearings, sealed, HD	4	1	**25695** - Bearing Housing, s.s., round with roller bearings, o-ring	5	4	**22399** - Roller Bearing	3 6	1 2	**22045** **23856**
25740 - Impeller Drive Assy., s.s., angled, roller bearings, sealed, HD	7	1	**25711** - Bearing Housing, s.s., angled with roller bearings, o-ring	5	4	**22399** - Roller Bearing	3 6	1 2	**22045** **23856**

Item	Quantity	Part Number and Description
		All impeller drive assemblies include the following parts:
8	1	**25692** - O-ring, -036 series, Viton
9	1	**25713** - Gear Case, stainless steel, o-rings (includes item 10)
10	4	**37040** - Dowel Pin, 1/4" x 5/8", 416 s.s.
11	1	**22084** - Pipe Plug, 1/4", s.s.
12	1	**25716** - Drain Plug, CC-D, magnetic
13	1	**25691** - Impeller Bearing Housing, o-ring, s.s.
14	1	**25693** - O-ring, -255 series, Viton
15	8	**10100** - Socket Head Cap Screw, 5/16-18 x 3/4", s.s.
16	1	**22036** - Oil Seal
–	1	**22037** - Roller Bearing (includes items 17–18)
17	1	**22183** - Roller Bearing Cup, 2-5/8" O.D.
18	1	**22184** - Roller Bearing Cone, 1-3/8" I.D.
19	1	**22044** - Seal
20	1	**22054** - Shaft, impeller (includes item 21)
21	1	**22081** - Dowel Pin, 3/8" x 31/32"
22	1	**22035** - Key
–	1	**22038** - Roller Bearing (includes items 23–24)
23	1	**22183** - Roller Bearing Cup, 2-5/8" O.D.
24	1	**22185** - Roller Bearing Cone, 1-5/16" I.D.
25	1	**22032** - Shims, set of 5, 1.322" I.D.
26	1	**22048** - Lock Washer
27	2	**22047** - Lock Nut
28	1	**22046** - Gears, 8P, 15 and 45 tooth, spiral bevel (matched set)
29	1	**22050** - Lock Washer
30	1	**22049** - Lock Nut
31	1	**22031** - Shims, set of 5, 1.01" I.D.
32	1	**22043** - Thrust Bearing
33	6	**10058** - Hex Head Cap Screw, 3/8-16 x 1", s.s.
34	1	**11401** - Grease Fitting, 1/8", straight, s.s.
35	1	**22564** - Pipe Plug, 1/8", s.s.
36	1	**23498** - Shaft, drive (includes item 38)
37	1	**25686** - Shaft, drive, heavy duty (heavy duty assemblies only; includes item 38)
38	1	**23499** - Key, 1/4" x 1/4" x 1-5/8"
39	1	**25685** - Key, 1/8" x 3/16" x 3/4", hardened
40	1	**17258** - Key, 3/16" x 3/16" x 3/4" (heavy duty assemblies only)
41	6	**10113** - Socket Head Cap Screw, 3/8-16 x 1-1/4", s.s.

This page intentionally left blank.

Manual Page Number	Revision

80 Parts, Cutting Heads:

The 23190 - Head Assembly, shred, wide, oval, s.s. is no longer available for purchase.

Optional Knives

- 8 **55419** - Knife, slicing, flat, bias bevel, heavy duty (**55418** pack of 48)

80-90 Parts, Cutting Heads:

Additional single ring heads are listed in the first chart on the following page. See the page references in the chart for the complete assemblies.

Double ring heads are listed in the second chart on the following page. Double ring heads are identical to single ring heads, except with the addition of a locking support adapter. This adapter is attached to the bottom of the cutting head, and has four cleats that lock against the tabs on the locking cutting head support (see the first entry for pages 78-79). Locking heads are typically used in heavy duty applications where quick removal of the cutting head is desirable. See the page references in the charts for the complete assemblies.

Grating head assemblies are described in the supplemental publication L2532. If the supplement is not included, contact your Urschel representative.

Flat-V head assemblies are described in the supplemental publication L2534. If the supplement is not included, contact your Urschel representative.

.480" crinkle cut head assemblies are described in the supplemental publication L2709. If the supplement is not included, contact your Urschel representative.

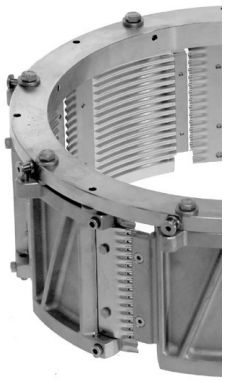
The 22899 - Top Support Ring, s.s., CC-D is replaced by:
22348 - Top Support Ring, s.s.

The 22071 - Locating Pin is replaced by:
23947 - Locating Pin, heavy duty

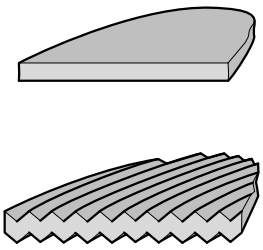
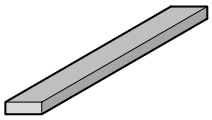
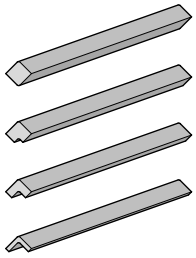
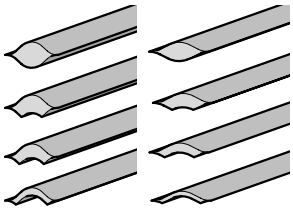
(continues on the next page)

Manual Page Number	Revision

80-90 Parts, Cutting Heads *(continued)*: Updated cutting head assemblies.



Single Adjustment, Single Ring

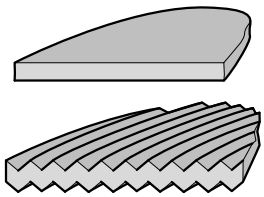
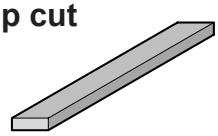
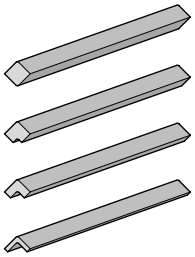
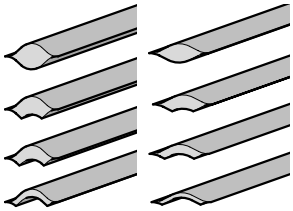
Product Cross Section	Part Number and Description	Page No.
Flat Slice and V Slice 	**23174** - Head Assembly, slice, flat, SS, GL, SA, SR **23171** - Head Assembly, slice, flat, 1/2", SS, GL, SA, SR **23403** - Head Assembly, slice, 125 V, SS, HP, GL, SA, SR	S.20
Strip cut 	**23404** - Head Assembly, strip cut, 1/8", SS, GL, SA, SR **23147** - Head Assembly, strip cut, 1/4", SS, GL, SA, SR **23148** - Head Assembly, strip cut, 3/4", SS, GL, SA, SR	S.22
Full and V Shred 	**22895** - Head Assembly, shred, 125 V, GL, SS, SA, SR **22922** - Head Assembly, shred, 125 V, HP, SS, GL, SA, SR **23140** - Head Assembly, shred, 170 V, SS, GL, SA, SR **23132** - Head Assembly, shred, 170 V, SS, HP, GL, SA, SR **22896** - Head Assembly, shred, 212 V, GL, SS, SA, SR	S.24
Oval and Crescent Shred Wide Oval and Wide Crescent Shred 	**22897** - Head Assembly, shred, oval, GL, SS, SA, SR	S.26

Notes:
Urschel part descriptions contain **abbreviations** to indicate the type of cutting head assembly. “Standard Product” and “Non-locking” are considered standard features and do not have an abbreviation in the part description.

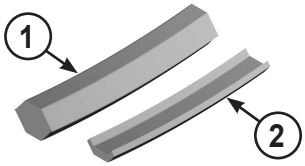
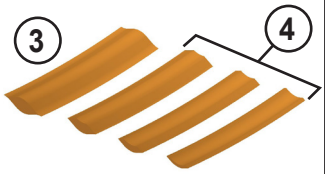
V Shred Head Assembly Descriptions: Urschel part descriptions contain the *type of knife* used in the assembly. For reference,
the 125 V knife produces the .070" (1.8 mm) shred,
the 170 V knife produces the .097" (2.5 mm) shred, and
the 212 V knife produces the .125" (3.2 mm) shred.

Abbreviations in Descriptions (Use with the charts above and to right)	
SA	Single Adjustment (no designation indicates single adjustment)
SR	Single Ring
DR	Double Ring
GL	Gateless
SS	Stainless Steel
HP	Hard Product (no designation indicates standard product)

Single Adjustment, Double Ring, Locking

Product Cross Section	Part Number and Description	Page No.
Flat Slice and V Slice 	**23352** - Head Assembly, slice, flat, SS, GL, SA, DR **23356** - Head Assembly, slice,flat, 1/2", SS, GL, SA, DR **23367** - Head Assembly, slice, 125 V, SS, HP, GL, SA, DR	S.28
Strip cut 	**23353** - Head Assembly, strip cut, 1/8", SS, GL, SA, DR **23354** - Head Assembly, strip cut, 1/4", SS, GL, SA, DR **23355** - Head Assembly, strip cut, 3/4", SS, GL, SA, DR	S.30
Full and V Shred 	**23361** - Head Assembly, shred, 125 V, SS, GL, SA, DR **23441** - Head Assembly, shred, 125 V, SS, HP, GL, SA, DR **23362** - Head Assembly, shred, 170 V, SS, GL, SA, DR **23440** - Head Assembly, shred, 170 V, SS, HP, GL, SA, DR **23363** - Head Assembly, shred, 212 V, SS, GL, SA, DR	S.32
Oval and Crescent Shred 	**23364** - Head Assembly, shred, oval, SS, GL, SA, DR	S.34

Additional Types of Cut

Flat-V® Full Shred **Flat-V Reduced Shred** 	The Flat V head assembly is used to produce ***full Flat-V shreds (1)*** with a hexagonal-shaped cross section measuring approximately .150" (3.8 mm) on all sides. A ***Reduced Flat-V shred (2)*** has a flattened top and bottom that form corrugated shreds. Contact an Urschel representative for information or to request a Flat-V head assembly supplement (Publication Number L2534 or update).
.480 Crinkle Shred Head Assembly 	The .480" Crinkle Shred head assemblies are used to produce ***full crinkle shreds (3)*** and ***reduced crinkle shreds (4)***. Full shreds are .480" (12.2 mm) in width and .152" (3.9 mm) in thickness, when measured at the thickest part of the shred. Reduced shreds are rounded along one side, and can be produced with different dimensions. Contact an Urschel representative for information or to request a .480" Crinkle head assembly supplement (Publication Number L2918 or update).
Grating Head Assembly 	The Model CC-DL can be equipped with a grating head assembly (shown at the left). Grating screens with different perforation patterns are available for use with a variety of products. Contact an Urschel representative for information on specific applications or to request a grating head supplement (Publication Number L2532 or update).

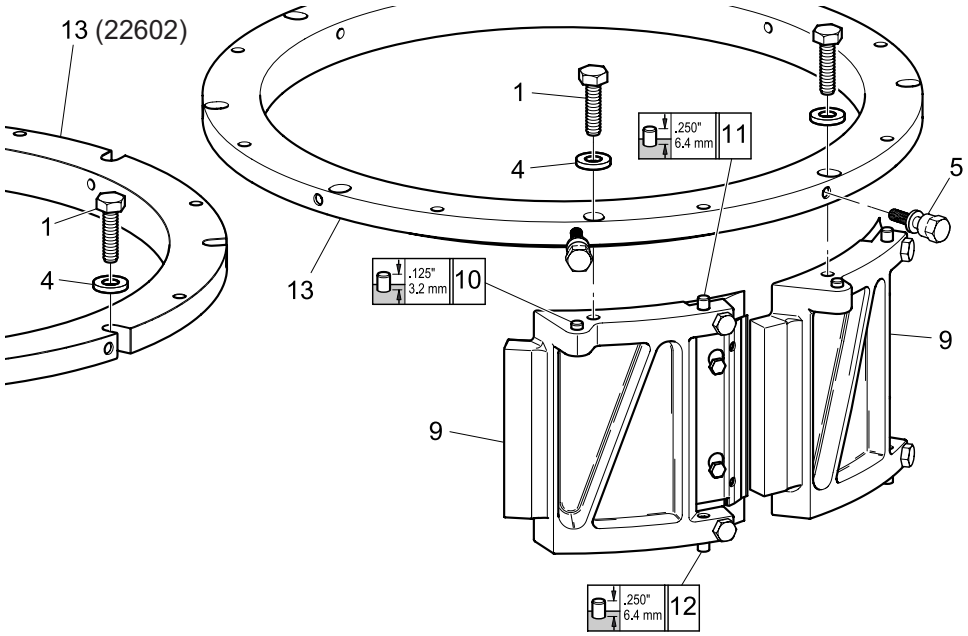
Manual Page Number	Revision

80-90 Parts, Cutting Heads *(continued)*: Updated cutting head assemblies.

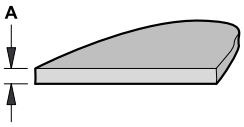
Type of cut: Slice, Flat and V

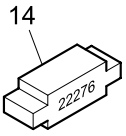
Features of these assemblies:

- **Single Adjustment**
- **Single Ring**
- **Standard Product**
- **Hard Product**
- **Stainless Steel**
- **Gateless Shoes**
- **Non-locking**

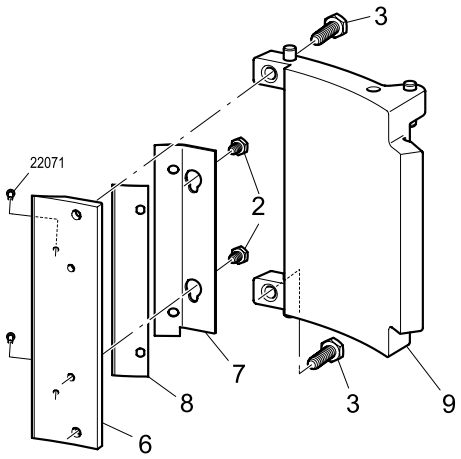


A = .010"-.500"
.25 mm - 12.7 mm

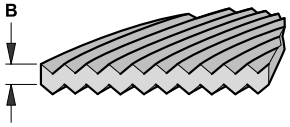


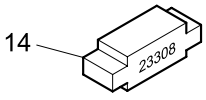


F040
F050
F060
F070

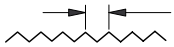


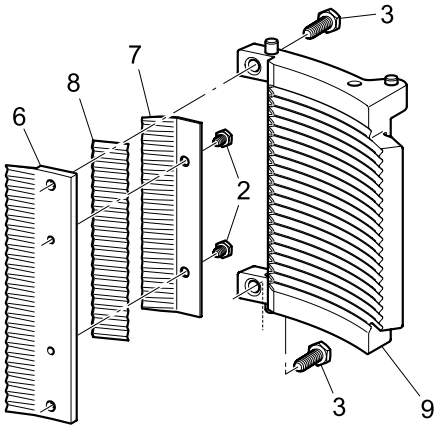
B = .030" - .285"
.8 mm - 7.2 mm





030
050
070
090





Manual Page Number	Revision

80-90 Parts, Cutting Heads *(continued)*: Updated cutting head assemblies.

Item	Quantity	Part Number and Description

The cutting head assembly includes items 1-5 below and items 6-13 in the chart.

1	8	**10048**	- Hex Head Cap Screw, 5/16-18 x 1-1/4", s.s.
2	16	**10224**	- Hex Head Cap Screw, 10-24 x 1/4", s.s.
	16	**22859**	- Screw, knife clamp, 10-24 x 1/4" (hard product only)
3	16	**10038**	- Hex Head Cap Screw, 1/4-20 x 3/4", s.s.
4	8	**22206**	- Washer, flat, .328 I.D. x .75 O.D. x .125"
5	8	**22898**	- Adjusting Screw, Hex, Nylok, CC-D

Optional knives for heavy duty applications.

22794 - Knife, slicing, flat, heavy duty, gold (**22793** - package of 96)
22936 - Knife, slicing, flat, standard bevel, gold (**22937** - package of 96)
55419 - Knife, slicing, flat, bias bevel, heavy duty (**55418** - package of 48)
22788 - Knife, slicing, crinkle, gold (**22787** - package of 96)
22857 - Knife, slicing, .212 V-cut, gold (**22858** - package of 96)

Dowel Pins in Cutting Shoes: See the shoes and pins in the illustration at the left. The chart with the pin item number lists dowel pin extension (distance the pin extends from the shoe).
Setting Block: See the setting blocks in the illustration at the left. The offset steps are listed in decimal inches. "F" indicates the flat slice dimension produced.
Abbreviations: SS - Stainless Steel GL - Gateless HP - Hard Product

Item	–	6	7	8	9 (10, 11, 12)	13	14
Quantity	1	8	8	8	8 (1, 1, 1)	1	1
	Description and Part Number						
Slice Thickness	Cutting Head Assembly	Knife Holder	Knife Clamp	Knife single knife, pack (quantity)	Cutting Shoe (includes Dowel Pins Item 10 - 22894, Item 11 - 22894, Item 12 - 22894)	Top Support Ring	Setting Block
Flat Slice, SS							
.030-.100" .8-2.5 mm	23174	22181	22074	22064, 22294 (96)	23149	22348	22276
.285-.500" 7.2-12.7 mm	23171	22181	22074	22064, 22294 (96)	23149	22602	22276

Item		–	6	7	8	9 (10, 11, 12)	13	14
Quantity		1	8	8	8	8 (1, 1, 1)	1	1
		Description and Part Number						
Size of Crinkle or V	Slice Thickness	Cutting Head Assembly	Knife Holder	Knife Clamp	Knife single knife, pack (quantity)	Cutting Shoe (includes Dowel Pins Item 10 - 37040, Item 11 - 37040, Item 12 - 22082)	Top Support Ring	Setting Block
V Slice, SS								
.125	.040-.100" 1.0-2.5 mm	23403 HP	22676	22677	22671, 22672 (96)	23396	22348	23308

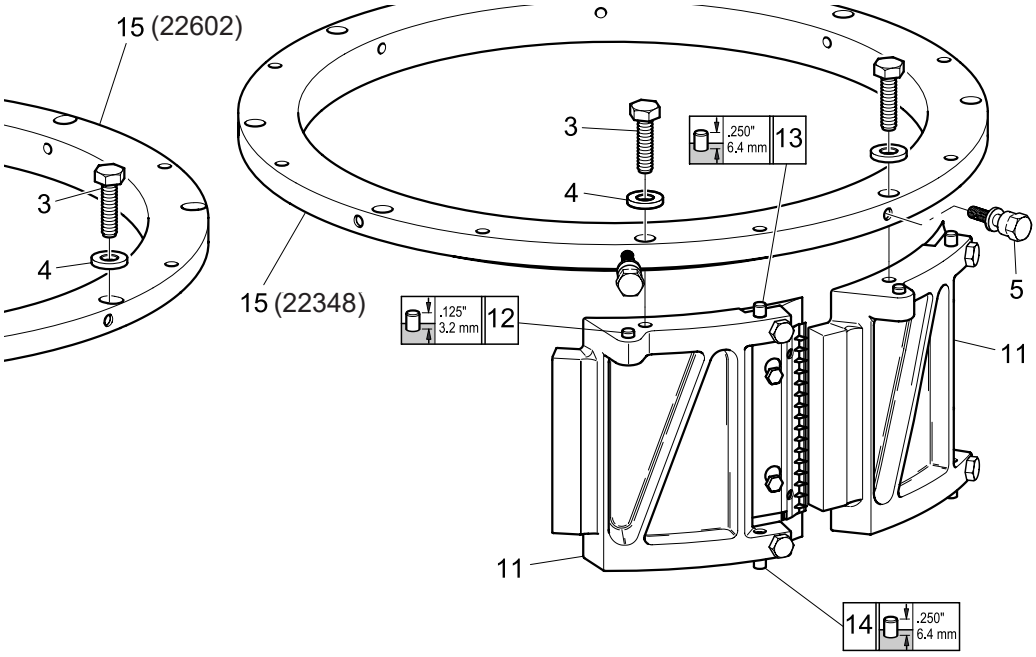
Manual Page Number	Revision

80-90 Parts, Cutting Heads *(continued)*: Updated cutting head assemblies.

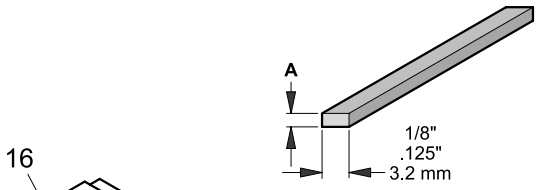
Type of cut: Strip

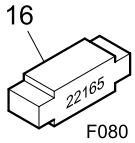
Features of these assemblies:

- **Single Adjustment**
- **Single Ring**
- **Standard Product**
- **Stainless Steel**
- **Gateless Shoes**
- **Non-locking**

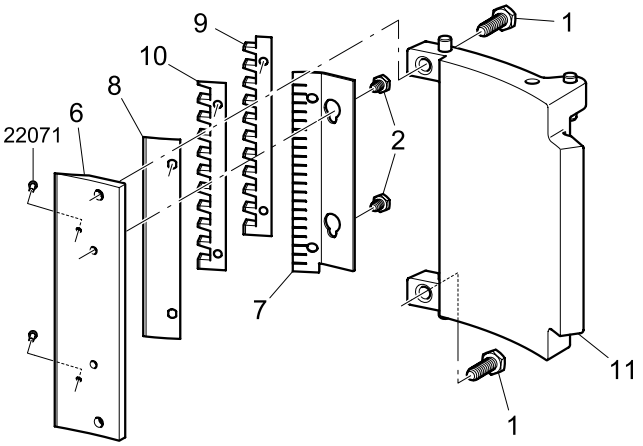


A = .030" - .100"
.8 mm - 2.5 mm

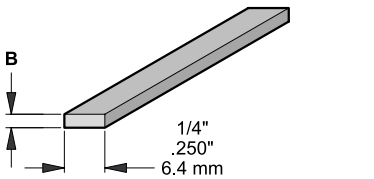


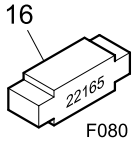


F080
F090
F100
F110

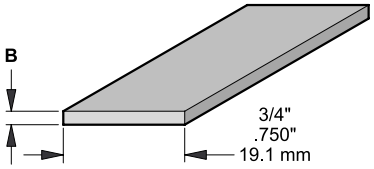


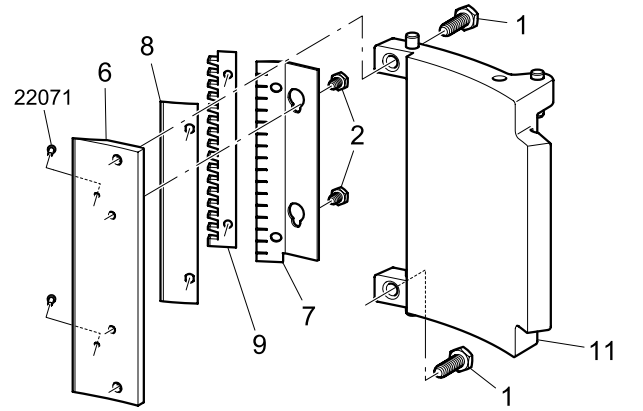
B = .030" - .100"
.8 mm - 2.5 mm





F080
F090
F100
F110





Manual Page Number	Revision

80-90 Parts, Cutting Heads *(continued)*: Updated cutting head assemblies.

Item	Quantity	Part Number and Description

The cutting head assembly includes items 1-5 below and items 6-15 in the chart.

1 16 **10038** - Hex Head Cap Screw, 1/4-20 x 3/4", s.s.
2 16 **10224** - Hex Head Cap Screw, 10-24 x 1/4", s.s.
3 8 **10048** - Hex Head Cap Screw, 5/16-18 x 1-1/4", s.s.
4 8 **22206** - Washer, flat, .328 I.D. x .75 O.D. x .125"
5 8 **22898** - Adjusting Screw, Hex, Nylok, CC-D

Optional knives and knife clamp for heavy duty applications.

22794 - Knife, slicing, flat, heavy duty bevel, gold (**22793** - package of 96)
22936 - Knife, slicing, flat, standard bevel, gold (**22937** - package of 96)
55419 - Knife, slicing, flat, bias bevel, heavy duty (**55418** - package of 48)
22671 - Knife, slicing, .125 V-cut, gold (**22672** - package of 96)
23804 - Knife Clamp, strip cut, 3/4" flat

Dowel Pins in Cutting Shoes: See the shoes and pins in the illustration at the left. The chart attached to the pin item number lists dowel pin extension (distance the pin extends from the shoe).
Setting Block: See the setting blocks in the illustration at the left. The offset steps are listed in decimal inches. "F" indicates the flat slice dimension produced.
Abbreviations: SS - Stainless Steel

Item	–	6	7	8	9	10	11 (12, 13, 14)	15	16
Quantity	1	8	8	8	8	8	8 (1, 1, 1)	1	1
	Description and Part Number								
Width of Strip	Cutting Head Assembly	Knife Holder	Knife Clamp	Knife, slicing single knife, pack (quantity)	Knife, strip cut single knife, pack (quantity)	Knife, strip cut single knife, pack (quantity)	Cutting Shoe (includes Dowel Pins Item 12 - 22894, Item 13 - 22894, Item 14 - 22894)	Top Support Ring	Setting Block
Strip Cut, SS									
1/8" 3.2 mm	23404	22181	23210	22064, 22294 (96)	22861, 22862 (96)	23208, 23209 (96)	23149	22602	22165
1/4" 6.4 mm	23147	22181	22860	22064, 22294 (96)	22861, 22862 (96)	–	23149	22348	22165
3/4" 19.1 mm	23148	22181	22219	22064, 22294 (96)	22781, 22783 (96)	–	23149	22348	22165

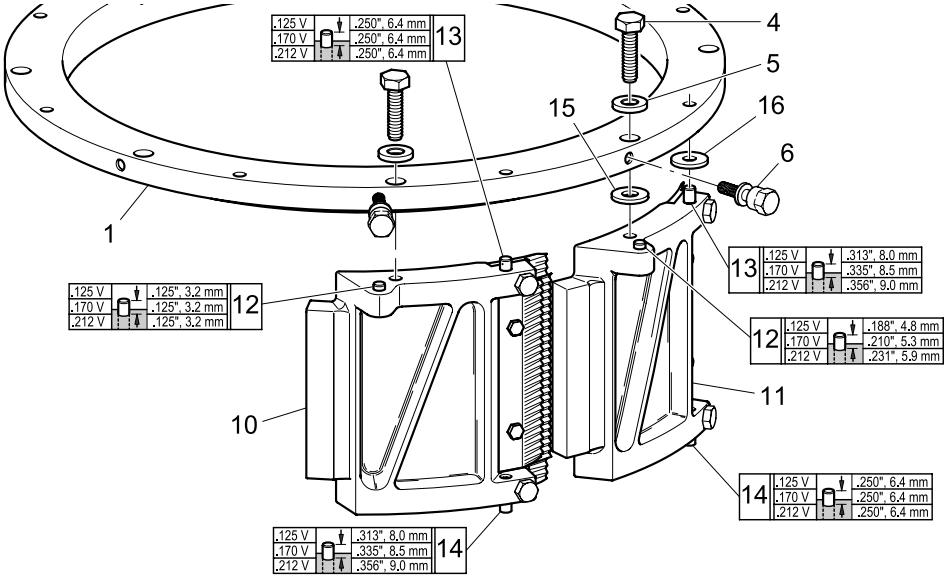
Manual Page Number	Revision

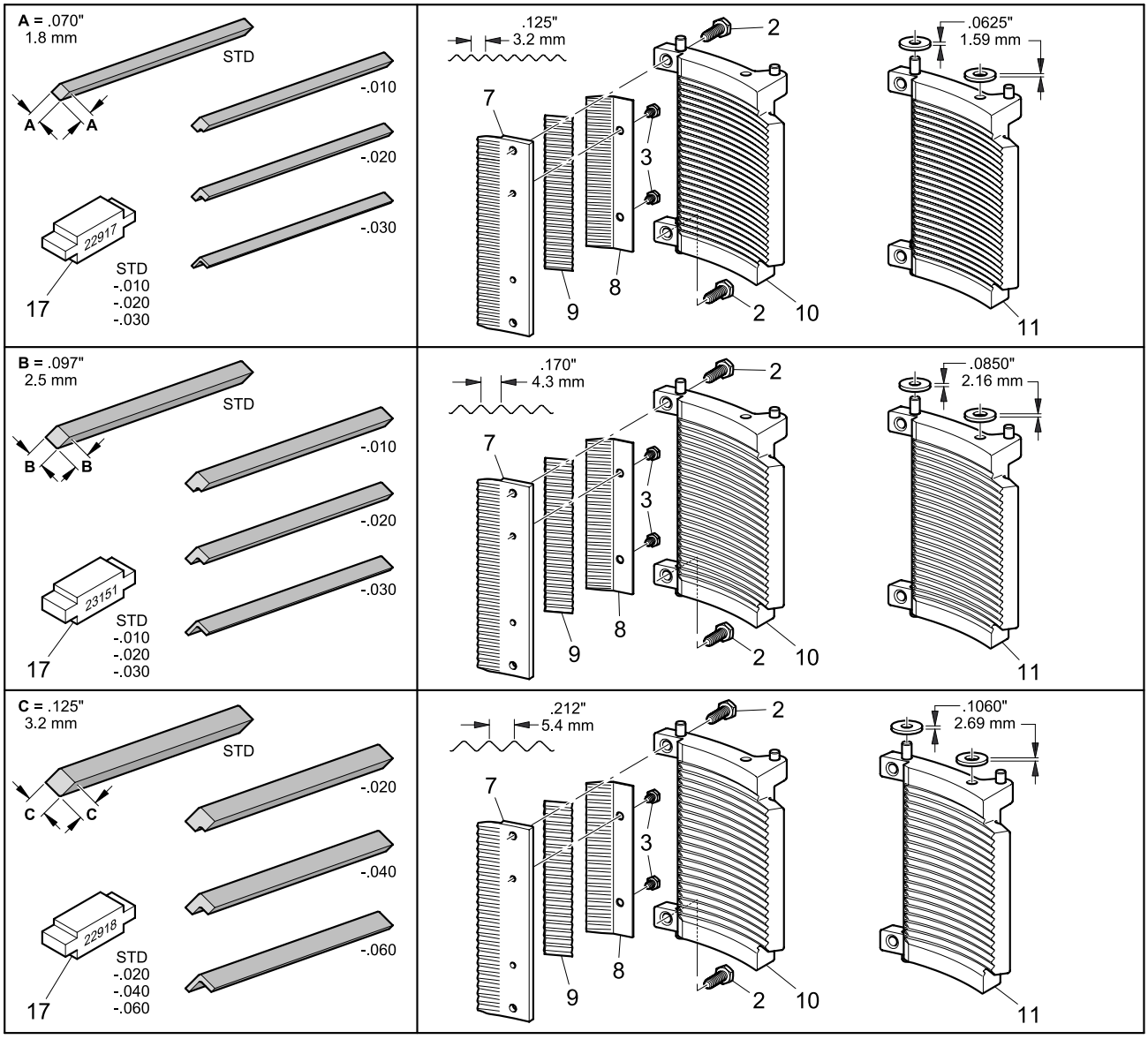
80-90 Parts, Cutting Heads *(continued)*: Updated cutting head assemblies.

Type of cut: Shred, Full and V

Features of these assemblies:

- **Single Adjustment**
- **Single Ring**
- **Standard Product**
- **Hard Product**
- **Stainless Steel**
- **Gateless Shoes**
- **Non-locking**





Manual Page Number	Revision

80-90 Parts, Cutting Heads *(continued)*: Updated cutting head assemblies.

Item	Quantity	Part Number and Description

The cutting head assembly includes items 1-6 below and items 7-16 in the chart.

1	1	**22348** - Top Support Ring, s.s.
2	16	**10038** - Hex Head Cap Screw, 1/4-20 x 3/4", s.s.
3	16	**10224** - Hex Head Cap Screw, 10-24 x 1/4", s.s.
	16	**22859** - Screw, knife clamp, 10-24 x 1/4", (hard product only)
4	8	**10048** - Hex Head Cap Screw, 5/16-18 x 1-1/4", s.s.
5	8	**22206** - Washer, flat, .328 I.D. x .75 O.D. x .125"
6	8	**22898** - Adjusting Screw, Hex, Nylok, CC-D

Optional knives for heavy duty applications.

23164 - Knife Clamp, .212 V-cut, hard product
22857 - Knife, slicing, .212 V-cut, gold (**22858** - package of 96)

Dowel Pins in Cutting Shoes: See the shoes and pins in the illustration at the left. The chart attached to the pin item number lists dowel pin extension (distance the pin extends from the shoe).
Setting Block: See the setting blocks in the illustration at the left. The steps are listed in decimal inches. "STD" setting will produce full shreds; minus settings will produce V shreds, reduced by the amount shown, in decimal inches.
Abbreviations: SS - Stainless Steel HP - Hard Product GL - Gateless

Item	–	7	8	9	10 11	12 13 14	15 16	17
Quantity	1	8	8	8	4 4	1 1 1	4 4	1
	Description and Part Number							
Size of Shred (Type of Knife)	Cutting Head Assembly	Knife Holder	Knife Clamp	Knife single knife, pack (quantity)	Cutting Shoe (includes items 12-14)	Dowel Pins	Spacers (set includes 4 of each)	Setting Block
Full and V Shreds, SS								
.070" 1.8 mm (.125 V)	22895 GL	22080	22077	22070, 22069 (96)	22888 22889	22894 22894 22894 22894 22894 22894	23489 23490 22803 (set)	22917
	22922 HP, GL	22676	22677	22671, 22672 (96)	22888 22889	22894 22894 22894 22894 22894 22894	23489 23490 22803 (set)	22917
.097" 2.5 mm (.170 V)	23140 GL	23141	23142	23143, 23144 (96)	23133 23134	22894 22894 22894 22894 22894 22894	23491 23492 23139 (set)	23151
	23132 HP, GL	23135	23136	23137, 23138 (96)	23133 23134	22894 22894 22894 22894 22894 22894	23491 23492 23139 (set)	23151
.125" 3.2 mm (.212 V)	22896 GL	22684	22685	22687, 22689 (96)	22890 22891	22894 22894 23019 22894 23019 22894	23493 23494 22804 (set)	22918

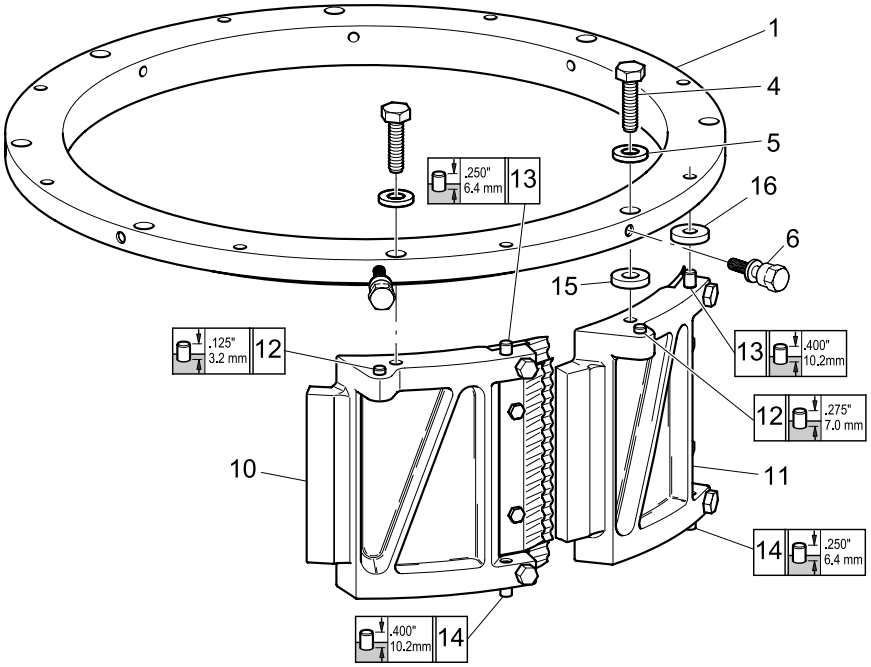
Manual Page Number	Revision

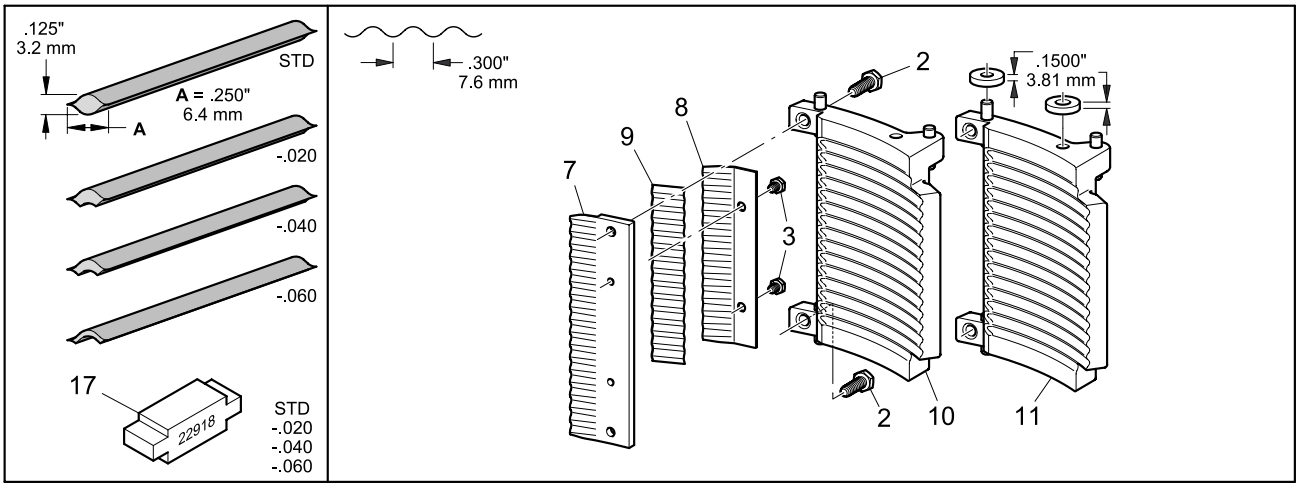
80-90 Parts, Cutting Heads *(continued)*: Updated cutting head assemblies.

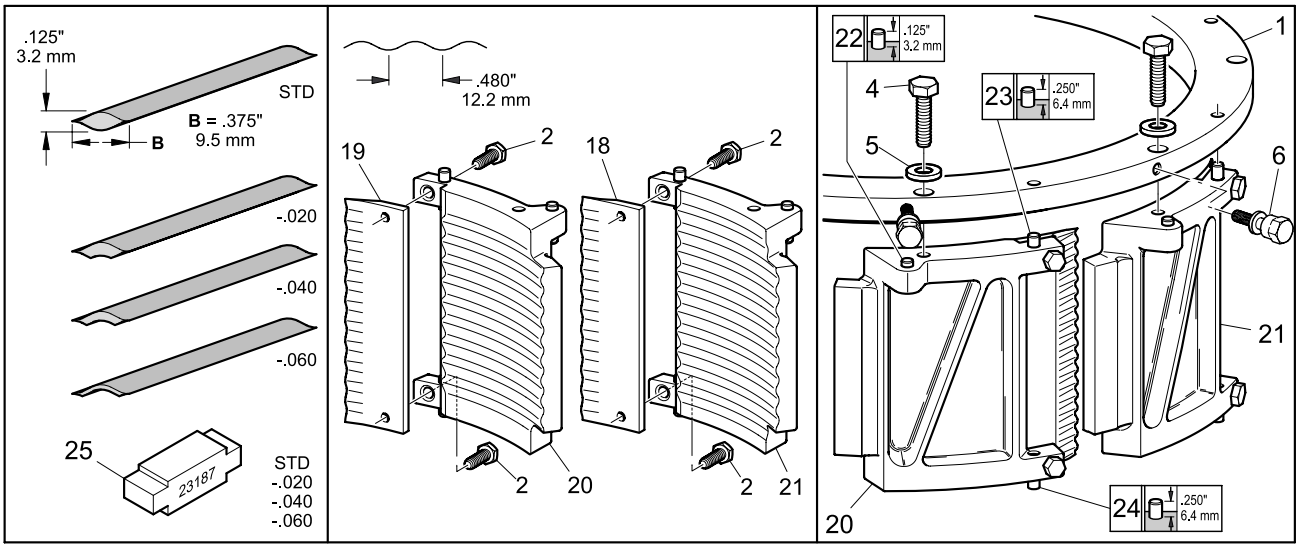
Type of cut: Shred, Oval, Crescent, Wide Oval, and Wide Crescent

Features of these assemblies:

- **Single Adjustment**
- **Single Ring**
- **Standard Product**
- **Stainless Steel**
- **Gateless Shoes**
- **Non-locking**







Manual Page Number	Revision

80-90 Parts, Cutting Heads *(continued)*: Updated cutting head assemblies.

Item	Quantity	Part Number and Description

The cutting head assembly includes items 1-6 below and items 7-16 or 18-24 in the charts.

1	1	**22348** - Top Support Ring, s.s.
2	16	**10038** - Hex Head Cap Screw, 1/4-20 x 3/4", s.s.
3	16	**10224** - Hex Head Cap Screw, 10-24 x 1/4", s.s.
4	8	**10048** - Hex Head Cap Screw, 5/16-18 x 1-1/4", s.s.
5	8	**22206** - Washer, flat, .328 I.D. x .75 O.D. x .125"
6	8	**22898** - Adjusting Screw, Hex, Nylok, CC-D

Optional knives for heavy duty applications.

23163 - Knife Clamp, crinkle, hard product
22788 - Knife, slicing, crinkle, gold (**22787** - package of 96)

Dowel Pins in Cutting Shoes: See the shoes and pins in the illustration at the left. The chart attached to the pin item number lists dowel pin extension (distance the pin extends from the shoe).
Setting Block: See the setting blocks in the illustration at the left. The steps are listed in decimal inches. "STD" setting will produce full shreds; minus settings will produce crescent shreds, reduced by the amount shown, in decimal inches.
Abbreviations: SS - Stainless Steel GL - Gateless

Item	7	8	9	10	11	12	13	14	15	16	17
Quantity	8	8	8	4	4	1	1	1	4	4	1
	Description and Part Number										
Cutting Head Assembly	Knife Holder	Knife Clamp	Knife single knife, pack (quantity)	Cutting Shoes (includes Items 12-14)		Dowel Pins			Spacers (set includes 4 of each)		Setting Block
Oval and Crescent Shreds, SS											
22897 GL	22182	22076	22212, 22210 (96)	22893	22892	22894	22894	23019 23019 23019	23495	23496 22802 (set)	22918

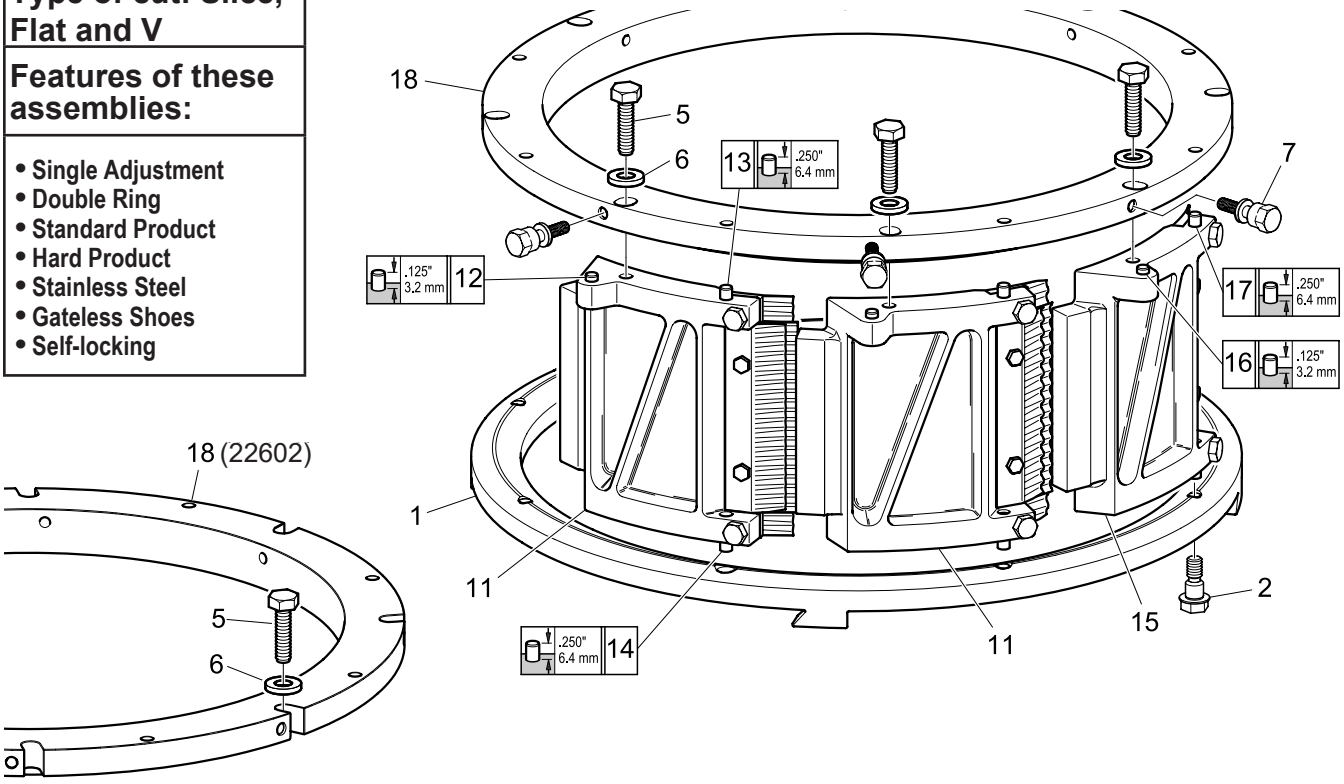
Manual Page Number	Revision

80-90 Parts, Cutting Heads *(continued)*: Updated cutting head assemblies.

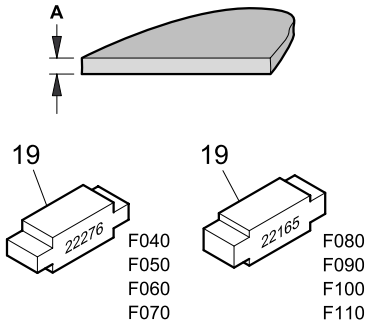
Type of cut: Slice, Flat and V

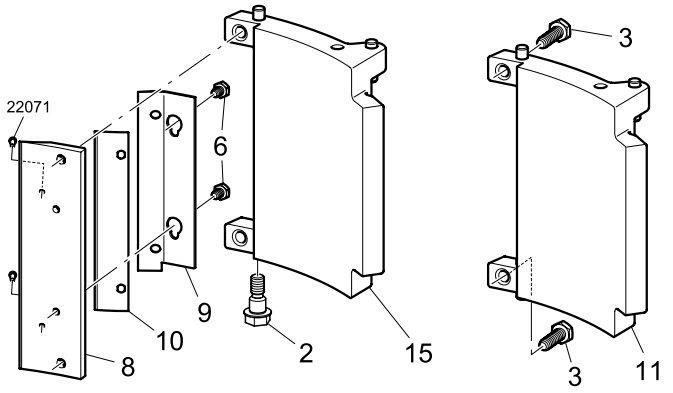
Features of these assemblies:

- Single Adjustment
- Double Ring
- Standard Product
- Hard Product
- Stainless Steel
- Gateless Shoes
- Self-locking

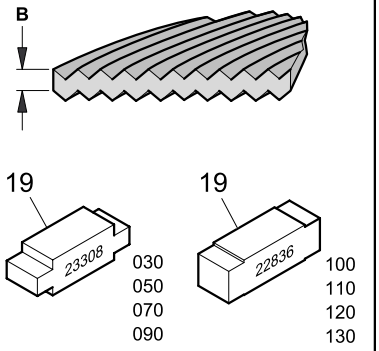


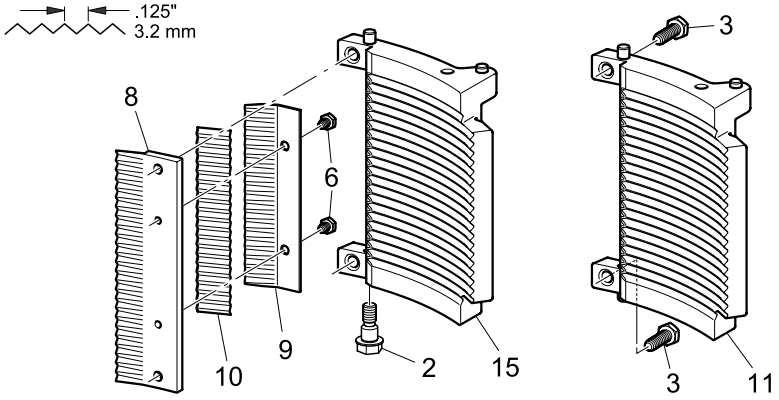
A = .030" - .500"
.8 mm - 12.7 mm





B = .040" - .100"
1.0 mm - 2.5 mm





Manual Page Number	Revision

80-90 Parts, Cutting Heads *(continued)*: Updated cutting head assemblies.

Item	Quantity	Part Number and Description

The cutting head assembly includes items 1-7 below and items 8-18 in the chart.

1	1	**23743** - Support Adapter, single ring to double ring, self locking, s.s., CC
2	2	**23657** - Bolt, adapter ring, self locking, CCX-D
3	16	**10038** - Hex Head Cap Screw, 1/4-20 x 3/4", s.s.
4	16	**10224** - Hex Head Cap Screw, 10-24 x 1/4", s.s.
	16	**22859** - Screw, knife clamp, 10-24 x 1/4", (hard product only)
5	8	**10048** - Hex Head Cap Screw, 5/16-18 x 1-1/4", s.s.
6	8	**22206** - Washer, flat, .328 I.D. x .75 O.D. x .125"
7	8	**22898** - Adjusting Screw, Hex, Nylok, CC-D

Optional knives for heavy duty applications.

22794 - Knife, slicing, flat, heavy duty, gold (**22793** - package of 96)
22936 - Knife, slicing, flat, standard bevel, gold (**22937** - package of 96)
55419 - Knife, slicing, flat, bias bevel, heavy duty (**55418** - package of 48)

Dowel Pins in Cutting Shoes: See the shoes and pins in the illustration at the left. The chart attached to the pin item number lists dowel pin extension (distance the pin extends from the shoe).
Setting Block: See the setting blocks in the illustration at the left. The steps are listed in decimal inches. "F" indicates flat slice, "K" indicates crinkle slice.
Abbreviations: SS - Stainless Steel HP - Hard Product GL - Gateless

Item	–	8	9	10	11 (12, 13, 14)	15 (16, 17)	18	19
Quantity	1	8	8	8	6 (1, 1, 1)	2 (1, 1)	1	1
	Description and Part Number							
Slice Thickness	Cutting Head Assembly	Knife Holder	Knife Clamp	Knife single knife pack (quantity)	Cutting Shoe (includes Dowel Pins Item 12 - 22894, Item 13 - 22894, Item 14 - 22894)	Cutting Shoe, Adapter (includes Dowel Pins Item 16 - 22894, Item 17 - 22894)	Top Support Ring	Setting Block
Flat Slice, SS								
.030-.100" .8-2.5 mm	23352	22181	22074	22064, 22294 (96)	23149	23346	22348	22276, 22165
.285-.500" 7.2-12.7 mm	23356	22181	22074	22064, 22294 (96)	23149	23346	22602	–

Item	–	8	9	10	11 (12, 13, 14)	15 (16, 17)	18	19
Quantity	1	8	8	8	6 (1, 1, 1)	2 (1, 1)	1	1
	Description and Part Number							
Slice Thickness	Cutting Head Assembly	Knife Holder	Knife Clamp	Knife single knife pack (quantity)	Cutting Shoe (includes Dowel Pins Item 12 - 37040, Item 13 - 37040, Item 14 - 22082)	Cutting Shoe, Adapter (includes Dowel Pins Item 16 - 37040, Item 17 - 37040)	Top Support Ring	Setting Block
V Slice, SS								
.125 V .040-.100" 1.0-2.5 mm	23367 HP	22676	22677	22671, 22672 (96)	23396	23402	22348	23308, 22836

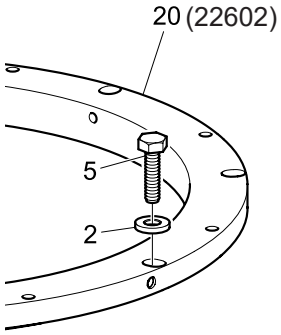
Manual Page Number	Revision

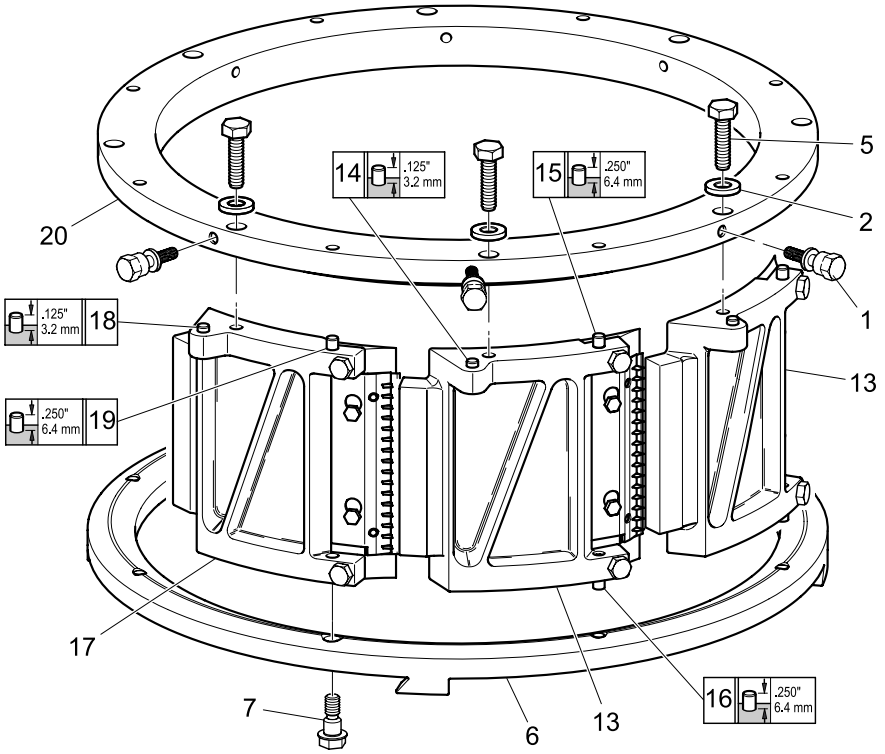
80-90 Parts, Cutting Heads *(continued)*: Updated cutting head assemblies.

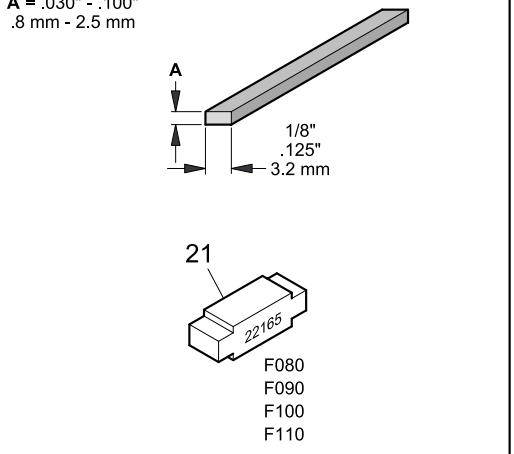
Type of cut: Strip

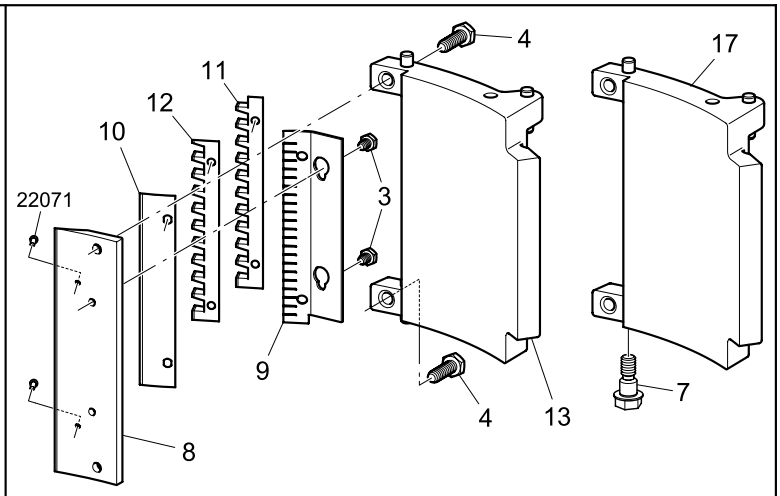
Features of these assemblies:

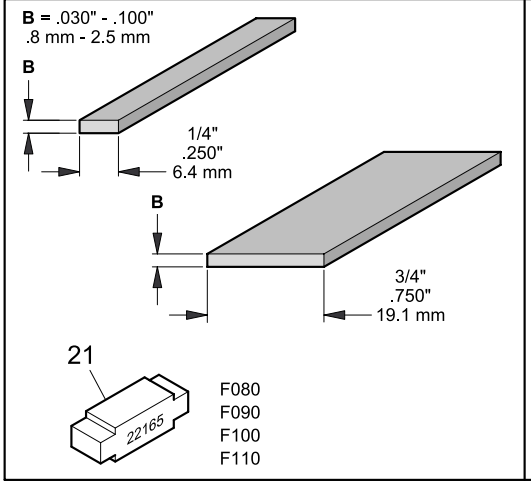
- Single Adjustment
- Double Ring
- Standard Product
- Stainless Steel
- Gateless Shoes
- Self-locking

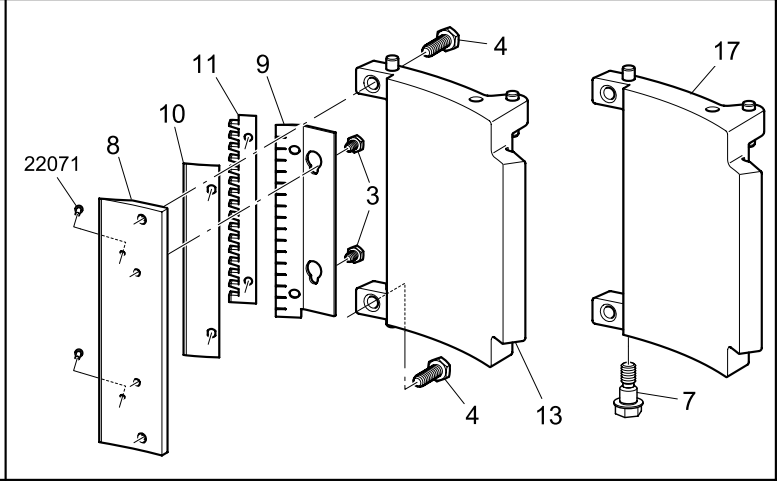












Manual Page Number	Revision

80-90 Parts, Cutting Heads *(continued)*: Updated cutting head assemblies.

Item	Quantity	Part Number and Description

The cutting head assembly includes items 1-7 below and items 8-20 in the chart.

1 8 **22898** - Adjusting Screw, Hex, Nylok, CC-D
2 8 **22206** - Washer, flat, .328 I.D. x .75 O.D. x .125"
3 16 **10224** - Hex Head Cap Screw, 10-24 x 1/4, s.s.
4 16 **10038** - Hex Head Cap Screw, 1/4-20 x 3/4", s.s.
5 8 **10048** - Hex Head Cap Screw, 5/16-18 x 1-1/4", s.s.
6 1 **23743** - Support Adapter, single ring to double ring, self locking, s.s., CC
7 2 **23657** - Bolt, adapter ring, self locking, CCX-D

Optional knives for heavy duty applications.

22794 - Knife, slicing, flat, heavy duty bevel, gold (**22793** - package of 96)
22936 - Knife, slicing, flat, standard bevel, gold (**22937** - package of 96)
55419 - Knife, slicing, flat, bias bevel, heavy duty (**55418** - package of 48)

Dowel Pins in Cutting Shoes: See the shoes and pins in the illustration at the left. The chart attached to the pin item number lists dowel pin extension (distance the pin extends from the shoe).
Setting Block: See the setting blocks in the illustration at the left. The steps are listed in decimal inches. “F” indicates flat slice.
Abbreviations: SS - Stainless Steel SL - Self Locking

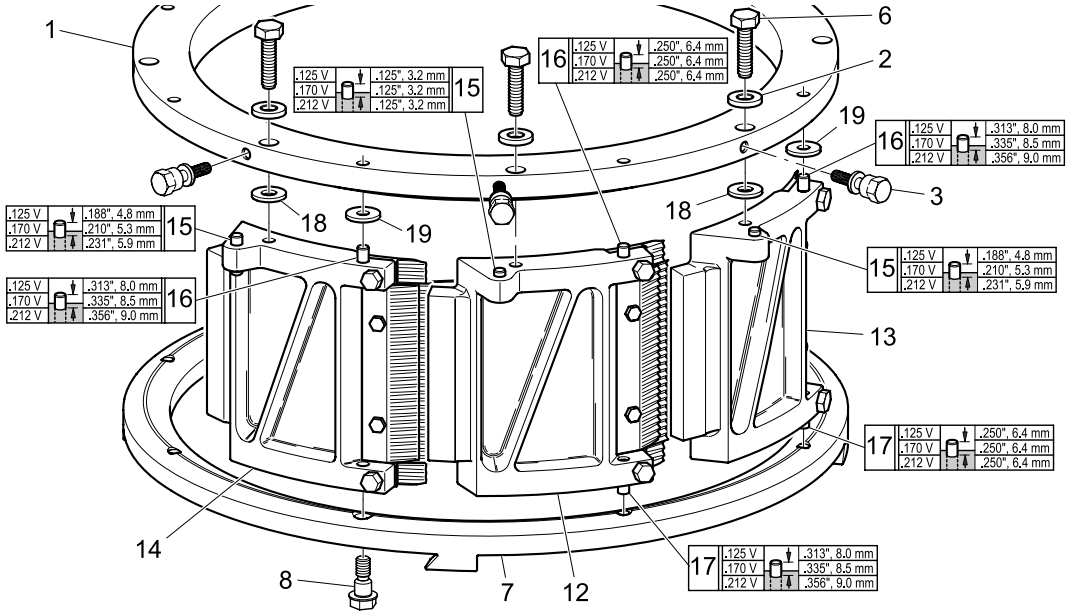
Item	–	8	9	10	11	12	13 (14, 15, 16)	17 (18, 19)	20	21
Quantity	1	8	8	8	8	8	6 (1, 1, 1)	2 (1, 1)	1	1
	Description and Part Number									
Width of Strip	Cutting Head Assembly	Knife Holder	Knife Clamp	Knife, slicing single knife, pack (quantity)	Knife, strip cut single knife, pack (quantity)	Knife, strip cut single knife, pack (quantity)	Cutting Shoe (includes Dowel Pins Item 14 - 22894, Item 15 - 22894, Item 16 - 22894)	Cutting Shoe, Adapter (includes Dowel Pins Item 18 - 22894, Item 19 - 22894)	Top Support Ring	Setting Block
Strip Cut, SS										
1/8" 3.2 mm	23353	22181	23210	22064, 22294 (96)	22861, 22862 (96)	23208, 23209 (96)	23149	23346	22602	22165
1/4" 6.4 mm	23354	22181	22860	22064, 22294 (96)	22861, 22862 (96)	– –	23149	23346	22348	22165
3/4" 19.1 mm	23355	22181	22219	22064, 22294 (96)	22781, 22783 (96)	– –	23149	23346	22348	22165

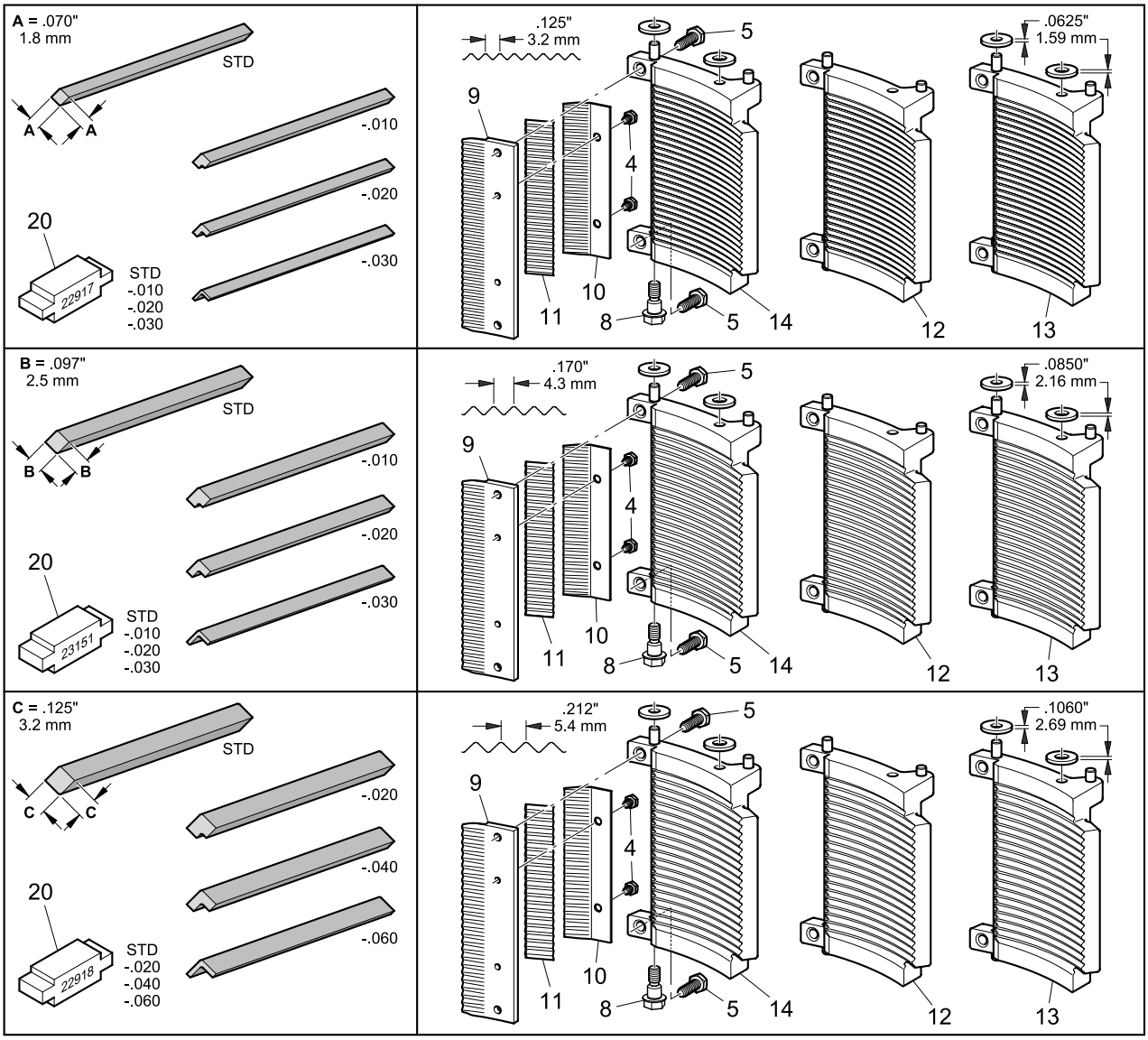
Manual Page Number	Revision
80-90	Parts, Cutting Heads *(continued)*: Updated cutting head assemblies.

Type of cut: Shred, Full and V

Features of these assemblies:

- Single Adjustment
- Double Ring
- Standard Product
- Hard Product
- Stainless Steel
- Gateless Shoes
- Self-locking





Manual Page Number	Revision

80-90 Parts, Cutting Heads *(continued)*: Updated cutting head assemblies.

Item	Quantity	Part Number and Description

The cutting head assembly includes items 1-8 below and items 9-19 in the chart.

1	1	**22348** - Top Support Ring, s.s.
2	8	**22206** - Washer, flat, .328 I.D. x .75 O.D. x .125"
3	8	**22898** - Adjusting Screw, Hex, Nylok, CC-D
4	16	**10224** - Hex Head Cap Screw, 10-24 x 1/4", s.s.
	16	**22859** - Screw, knife clamp, 10-24 x 1/4" (hard product only)
5	16	**10038** - Hex Head Cap Screw, 1/4-20 x 3/4", s.s.
6	8	**10048** - Hex Head Cap Screw, 5/16-18 x 1-1/4", s.s.
7	1	**23743** - Support Adapter, single ring to double ring, self-locking, s.s., CC
8	2	**23657** - Bolt, adapter ring, self locking, CCX-D

Optional knives for heavy duty applications.

23164 - Knife Clamp, .212 V-cut, hard product (use 16 - 22859 Screw, knife clamp, 10-24 x 1/4")
22857 - Knife, slicing, .212 V-cut, gold (**22858** - package of 96)

Dowel Pins in Cutting Shoes: See the shoes and pins in the illustration at the left. The chart attached to the pin item number lists dowel pin extension (distance the pin extends from the shoe).
Setting Block: See the setting blocks in the illustration at the left. The steps are listed in decimal inches. "STD" setting will produce full shreds; minus settings will produce crescent shreds, reduced by the amount shown, in decimal inches.
Abbreviations: SS - Stainless Steel HP - Hard Product GL - Gateless

Item	–	9	10	11	12	13	14	15	16	17	18	19	20
Quantity	1	8	8	8	4	2	2	1	1	1	4	4	1
Size of Shred (Type of Knife)	Description and Part Number												
	Cutting Head Assembly	Knife Holder	Knife Clamp	Knife single knife, pack (quantity)	Cutting Shoe (includes items 15-17)			Dowel Pins			Spacers (set includes 4 of each)		Setting Block
Full and V Shreds, SS													
.070" 1.8 mm (.125 V)	23361 GL	22080	22077	22070, 22069 (96)	22888			22894	22894	22894	23489	23490	22917
						22889		22894	22894	22894	22803 (set)		
							23320	22894	22894	–			
	23441 HP, GL	22676	22677	22671, 22672 (96)	22888			22894	22894	22894	23489	23490	22917
						22889		22894	22894	22894	22803 (set)		
							23320	22894	22894	–			
.097" 2.5 mm (.170 V)	23362 GL	23141	23142	23143, 23144 (96)	23133			22894	22894	22894	23491	23492	23151
						23134		22894	22894	22894	23139 (set)		
							23321	22894	22894	–			
	23440 HP, GL	23135	23136	23137, 23138 (96)	23133			22894	22894	22894	23491	23492	23151
						23134		22894	22894	22894	23139 (set)		
							23321	22894	22894	–			
.125" 3.2 mm (.212 V)	23363 GL	22684	22685	22687, 22689 (96)	22890			22894	22894	23019	23493	23494	22918
						22891		22894	23019	22894	22804 (set)		
							23322	22894	22894	–			

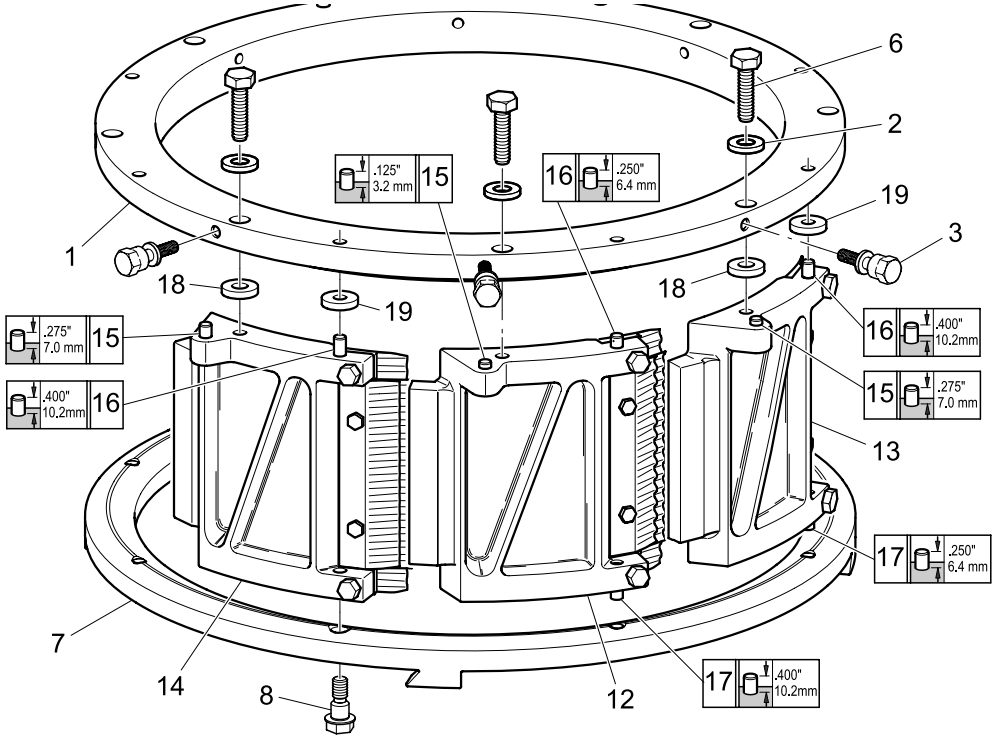
Manual Page Number	Revision

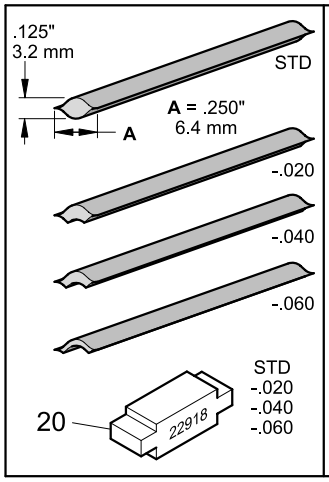
80-90 Parts, Cutting Heads *(continued)*: Updated cutting head assemblies.

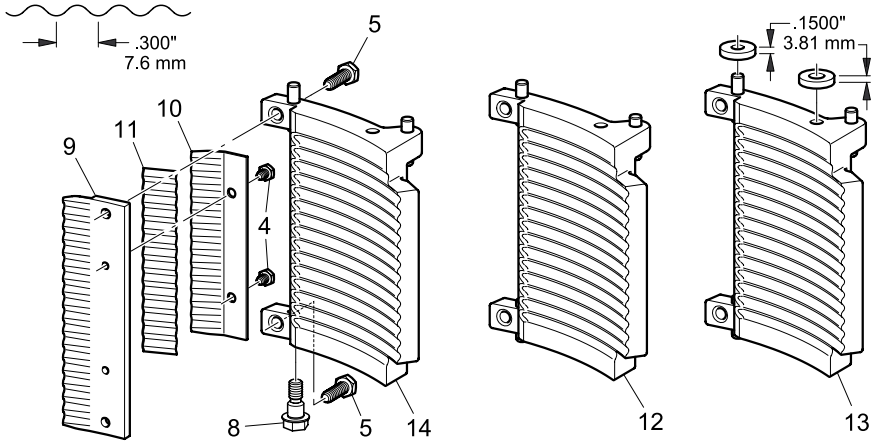
Type of cut: Shred, Oval and Crescent

Features of these assemblies:

- **Single Adjustment**
- **Double Ring**
- **Standard Product**
- **Stainless Steel**
- **Gateless Shoes**
- **Self-locking**







Manual Page Number	Revision

80-90 Parts, Cutting Heads *(continued)*: Updated cutting head assemblies.

Item	Quantity	Part Number and Description

The cutting head assembly includes items 1-8 below and items 9-19 in the chart.

1	1	**22348** - Top Support Ring, s.s.
2	8	**22206** - Washer, flat, .328 I.D. x .75 O.D. x .125"
3	8	**22898** - Adjusting Screw, Hex, Nylok, CC-D
4	16	**10224** - Hex Head Cap Screw, 10-24 x 1/4", s.s.
5	16	**10038** - Hex Head Cap Screw, 1/4-20 x 3/4", s.s.
6	8	**10048** - Hex Head Cap Screw, 5/16-18 x 1-1/4", s.s.
7	1	**23743** - Support Adapter, single ring to double ring, self locking, s.s., CC
8	2	**23657** - Bolt, adapter ring, self locking, CCX-D

Optional knives for heavy duty applications.

23163 - Knife Clamp, crinkle, hard product

22788 - Knife, slicing, crinkle, gold (**22787** - package of 96)

Dowel Pins in Cutting Shoes: See the shoes and pins in the illustration at the left. The chart attached to the pin item number lists dowel pin extension (distance the pin extends from the shoe).

Setting Block: See the setting blocks in the illustration at the left. The steps are listed in decimal inches. “STD” setting will produce full shreds; minus settings will produce crescent shreds, reduced by the amount shown, in decimal inches.

Abbreviations: SS - Stainless Steel GL - Gateless

Item	9	10	11	12 13 14	15 16 17	18 19	20
Quantity	8	8	8	4 2 2	1 1 1	4 4	1
	Description and Part Number						
Cutting Head Assembly	Knife Holder	Knife Clamp	Knife single knife, pack (quantity)	Cutting Shoe (includes items 15-17)	Dowel Pins	Spacers (set includes 4 of each)	Setting Block
Oval and Crescent Shred, SS							
23364 GL	22182	22076	22212, 22210 (96)	22893 / 22892 / 23319	22894 22894 23019 / 23019 23019 22894 / 23019 23019 –	23495 23496 22802 (set)	22918

Manual Page Number	Revision

88 Parts, Cutting Heads: The 23190 - Head Assembly, shred, wide, oval, s.s. is no longer available for purchase.

92-93 Parts, Motor and Drive Parts: Make the following revisions.

In the illustration, items 12 and 14 (timing pulleys) should be installed with the “V” shape of the teeth pointing in the opposite direction.

The 10142 - Socket Set Screw, 5/16-18 x 5/8", cup point, s.s. is replaced by:
10437 - Socket Set Screw, 5/16-18 x 1/2", 17-4, Nylok (items 13 and 15).

The 23243 - Pulley, timing, 44 teeth, Eagle PD is replaced by:
23803 - Pulley Assembly, timing, 44 teeth, Eagle PD Taper (item 14).

The 20174 - Key, 5/16" x 5/16" x 1-15/16" is replaced by:
23566 - Key, 5/16" x 5/16" x 2-13/32

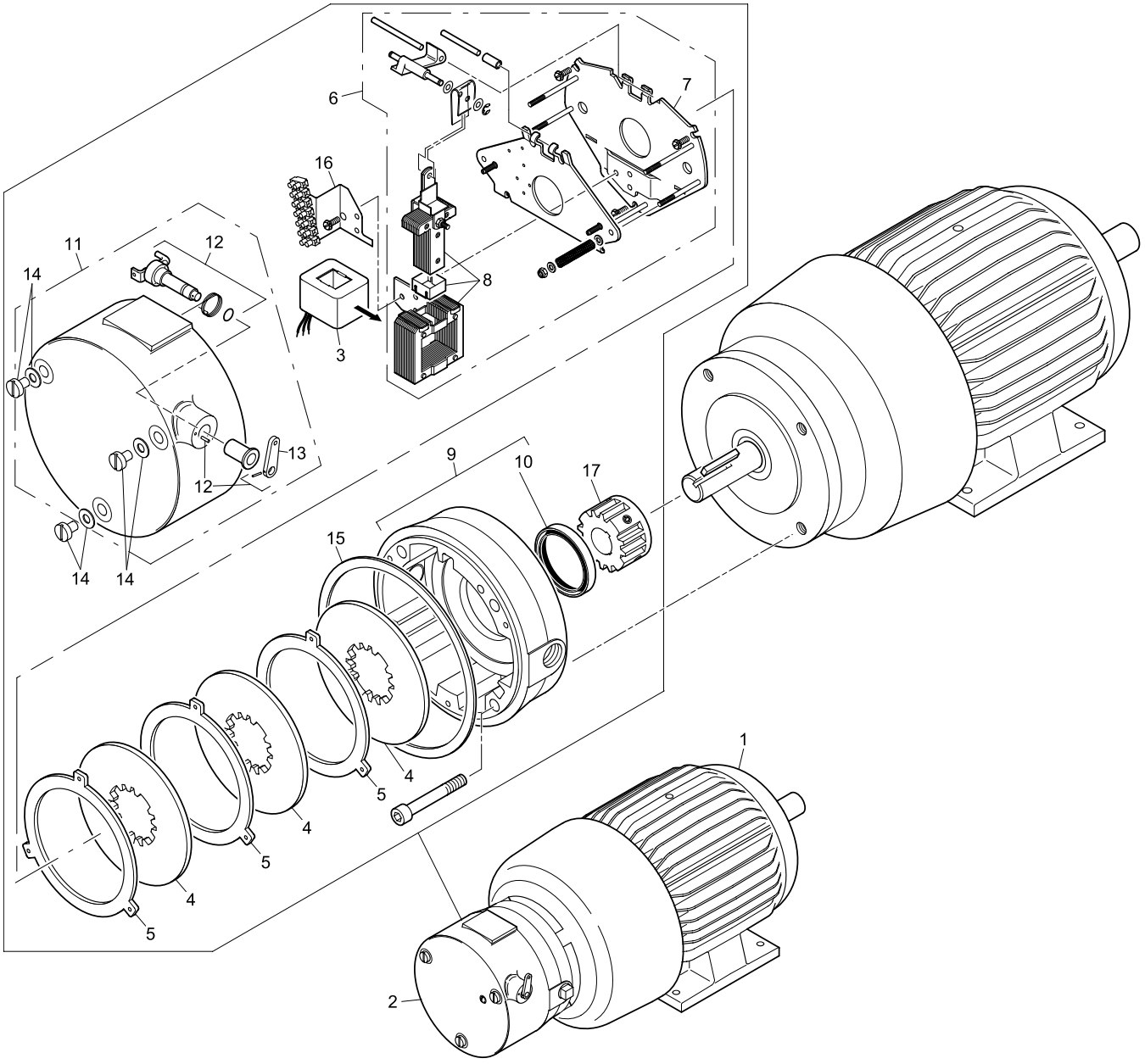
The following motors replace the motors listed on page 93.
13760 - Motor, 5 hp, 200-208 volt, with brake
13759 - Motor, 5 hp, 230/400 volt, with brake
13758 - Motor, 5 hp, 230/460 volt, with brake
13761 - Motor, 5 hp, 575 volt, with brake
23853 - Motor, 10 hp, 200/208 volt, 110 volt, with brake
23854 - Motor, 10 hp, 220-240/380-415 volt, 110 volt, brake
23852 - Motor, 10 hp, 230/460 volt, 110 volt, with brake
23855 - Motor, 10 hp, 575 volt, 110 volt, with brake

Optional Stainless Steel Motor
25812 - Motor, 5 hp, s.s., multi-volt, with brake

Manual Page Number	Revision
94-95	Parts, 10 LB-FT Stearns 56200 Brake Assembly: Make the following revisions. The 12897 - Brake Assembly, 10 pound foot, with 110 volt coil and the 12898 - Brake Assembly, 10 pound foot, with 220 volt coil are replaced by: **21818** - Brake Assembly, 10 pound foot, dual voltage/frequency, 56200. The **12891** - Stationary Disc Kit (item 5) includes 2 discs and 6 springs. The **12892** - Support Plate Assembly (item 6) includes **12904** - Plunger, link and frame assembly (item 16). The **12895** - Hub (item 17) has a 7/8" diameter bore. Use the **21343** - Hub and Set Screw Assembly for 1-1/8" diameter motor shafts. *(continues on the next page)*

Manual Page Number	Revision

94-95 Parts, 10 LB-FT Stearns 56200 Brake Assembly *(continued)*: The 20 lb/ft brake assembly listed below is used on current machines equipped with a 10 hp motor.



Item	Quantity	Part Number and Description
1	1	* - Motor, with brake (includes item 2)
2	1	**21536** - Brake Assembly, 20 foot pounds, 110 volt coil, 56200 (includes items 3-17)
	1	**21402** - Brake Assembly, 20 foot pounds, with coil, 56200 (includes items 3-17)
3	1	**12887** - K4+ Solenoid Coil, 110-120 volts (use with the 21536 brake assembly)
	1	**12888** - K4+ Solenoid Coil, 200-240 volts (use with the 21402 brake assembly)
4	3	**12890** - Friction Disc, Stearns 56200 brake
5	1	**21344**** - Stationary Disc Kit, Stearns 56200
6	1	**21345** - Support Plate Assembly, Stearns 25600 brake (includes items 7-8)
7	1	**12903** - Support Plate and Spring Stud Assembly, 56200
8	1	**12904** - Plunger, link and frame assembly, 56200 brake
9	1	**12893** - Endplate and Seal Assembly, Stearns 56200 brake (includes item 10)
10	1	**12906** - Seal for Endplate, Stearns 56200 brake
11	1	**12894** - Housing and Release Assembly, 56200 brake (includes items 12-13)
12	1	**12910** - Manual Release Assembly, 56200 brake (includes item 13)
13	1	**12913** - Handle, manual release, s.s., 56200 brake
14	3	**12911** - Housing Nuts and Gaskets, 56200 brake
15	1	**12905** - Gasket, housing and endplate, 56200 brake
16	1	**12909** - Terminal Kit, Stearns 56200 brake
17	1	**21343** - Hub and Set Screw Assembly, Stearns brake (1-1/8" bore)

Alternate solenoid coil and hub:

–	1	**12889** - K4+ Solenoid Coil, 575 volts
–	1	**12895** - Hub and Set Screw Assembly, Stearns 56200 brake (7/8" bore, for motors with 7/8" diameter shaft, replaces item 17)

* See the entry for pages 92-93.

** Stationary disc kit includes 3 discs and springs. Discard the springs as they are not required for 20 pound foot horizontally mounted brakes.

Manual Page Number	Revision
96-97	Parts, 10 LB-FT Stearns 55400 Brake Assembly: The following parts are no longer available. 12627 - Support Plate Assembly 12668 - Plunger, link and frame assembly 12664 - Hub and Set Screw Assembly, 6 pound foot brake, 7/8" bore 12663 - Housing Stud 12674 - Release Lever The entire brake assembly must be replaced if any of the above parts fail. When evaluating the purchase of a brake assembly, you may wish to compare to the cost of a new motor and brake. Contact your Urschel representative for more information. The following brake assemblies can be used for replacement. Older machines may require the brake wires to be lengthened using a butt splice.

Manual Page Number	Revision

98-113 Electrical Assembly:

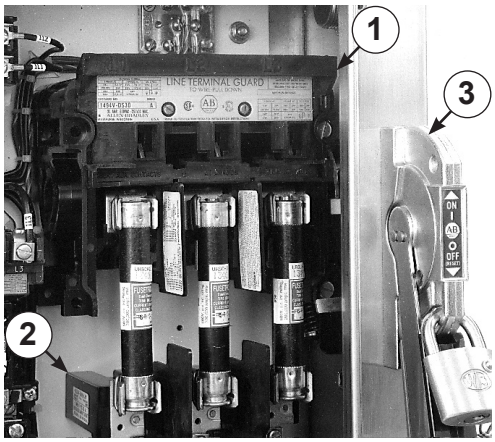
Pages A.42-A.65 contain the current electrical assemblies, wiring diagrams, and switch assembly supplied on current machines.

Pages A.66-A.92 contain repair parts for discontinued electrical assemblies. Repair parts are available unless otherwise noted.

Pages 98-113 in the manual contain repair parts for discontinued electrical assemblies. Repair parts are available unless otherwise noted.

Pages 98-101: The Allen-Bradley 1494 ***Series A disconnect (1)*** and ***fuse block (2)*** are no longer available. The ***operating mechanism (3)*** can be purchased from Urschel as a repair part only.

There is a retrofit procedure for replacing the Allen-Bradley disconnect, fuse blocks, and operating mechanism with an IEC style rotary disconnect handle, disconnect switch, fuse holder or circuit breakers. Contact your Urschel representative or request technical bulletin L2424 for more information.



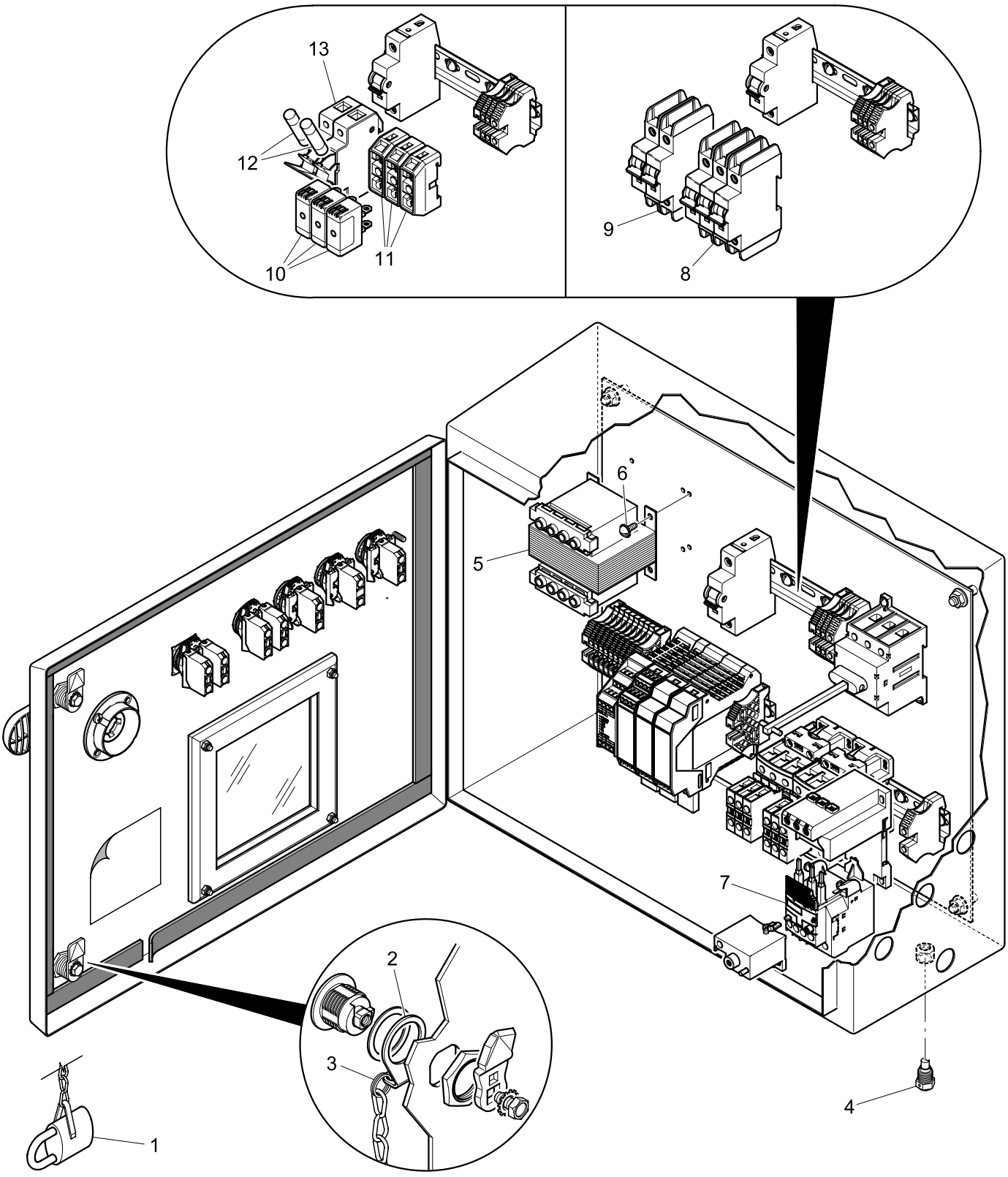
Pages 102-107: The disconnect switch and disconnect handle (Urschel part numbers 12942 and 21241) have been replaced by a retrofit assembly (part number **21630**). Contact your Urschel representative for more information.

Page 110: The 13723 - Wiring Diagram, is replaced by:
23487 - Wiring Diagram, ANSI. See the previous electrical assemblies included in this addendum.

Manual Page Number	Revision

98-113 Parts, Electrical Assembly, 5 HP: The electrical assembly and enclosure assembly currently in use are shown below and on the following pages.

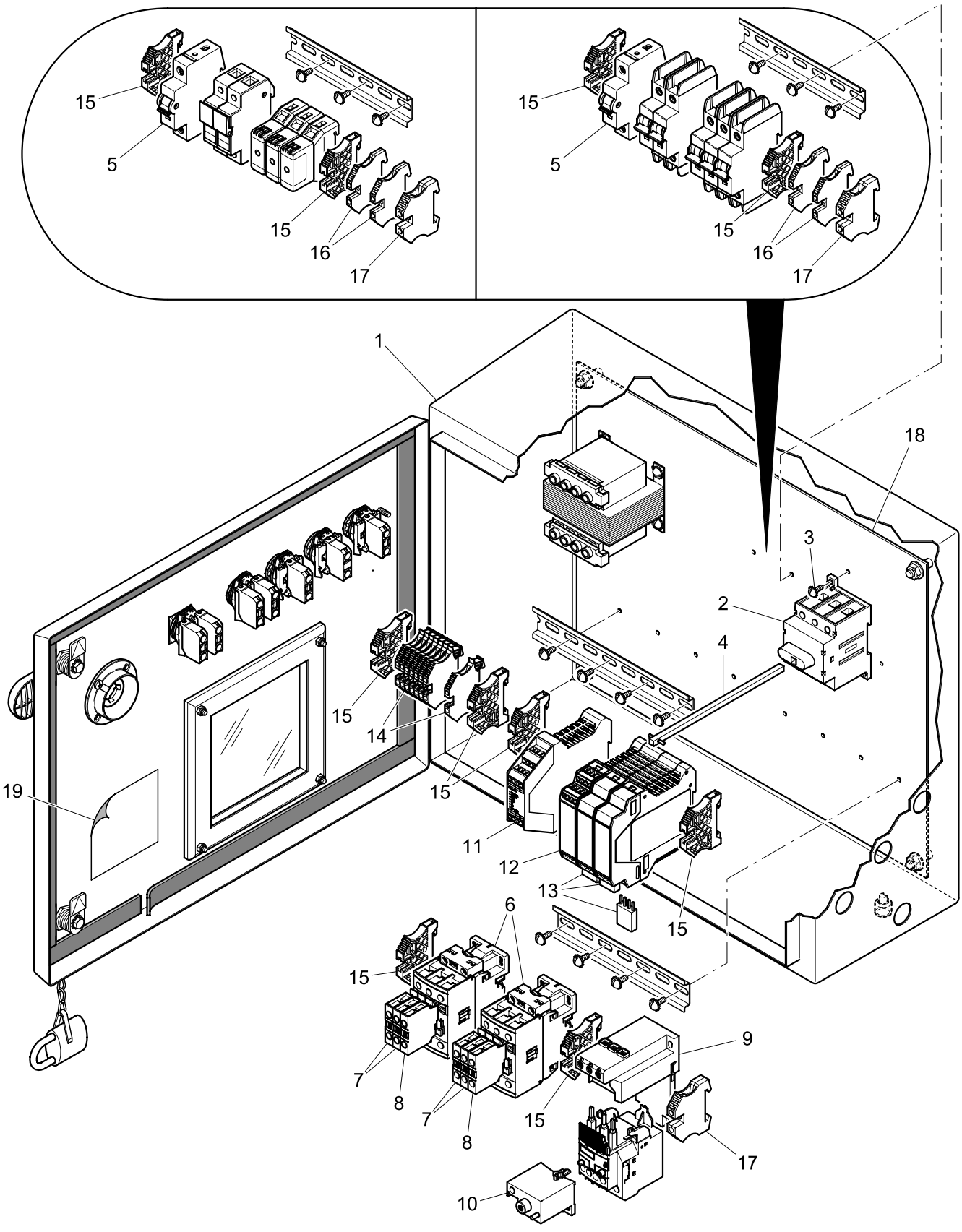
*Current assemblies are supplied with **fuses or mini circuit breakers (MCB)**. See the information in this addendum to determine which device is appropriate for your machine.*



Item	Quantity	Part Number and Description
–	1	**25792** - Electrical Assembly, CC-D, 5 HP (includes items 1–13)
1	1	**13408** - Padlock With Chain
2	1	**21778** - Padlock Retainer
3	1	**21499** - Split Ring, s.s.
4	1	**11593** - Breather/Drain 1/4"
5	1	* - Control Circuit Transformer, 50 VA (CCT)
6	4	**10625** - Round Head Machine Screw, with washer, 10-32 x 1/2"
7	1	* - Overload Relay (OL1)
Short Circuit Protective Device (SCPD), choose circuit breakers (items 8–9) or fuses (items 10–13).		
8	1	* - Circuit Breaker, mini, 3 pole (MCB1, main)
9	1	* - Circuit Breaker, mini, 2 pole (MCB2, primary)
10	3	* - Fuse, cube (FU1, main)
11	3	**21349** - Fuse Base, 30 amp, cube (for FU1)
12	2	* - Fuse (FU2, primary)
13	1	**12930** - Modular Fuse Holder, 2 pole (for FU2)

***** See Short Circuit Protective Device (SCPD) Charts on the following pages.
Electrical assemblies also include the Safety Switches and Enclosure Fittings. See the following pages.

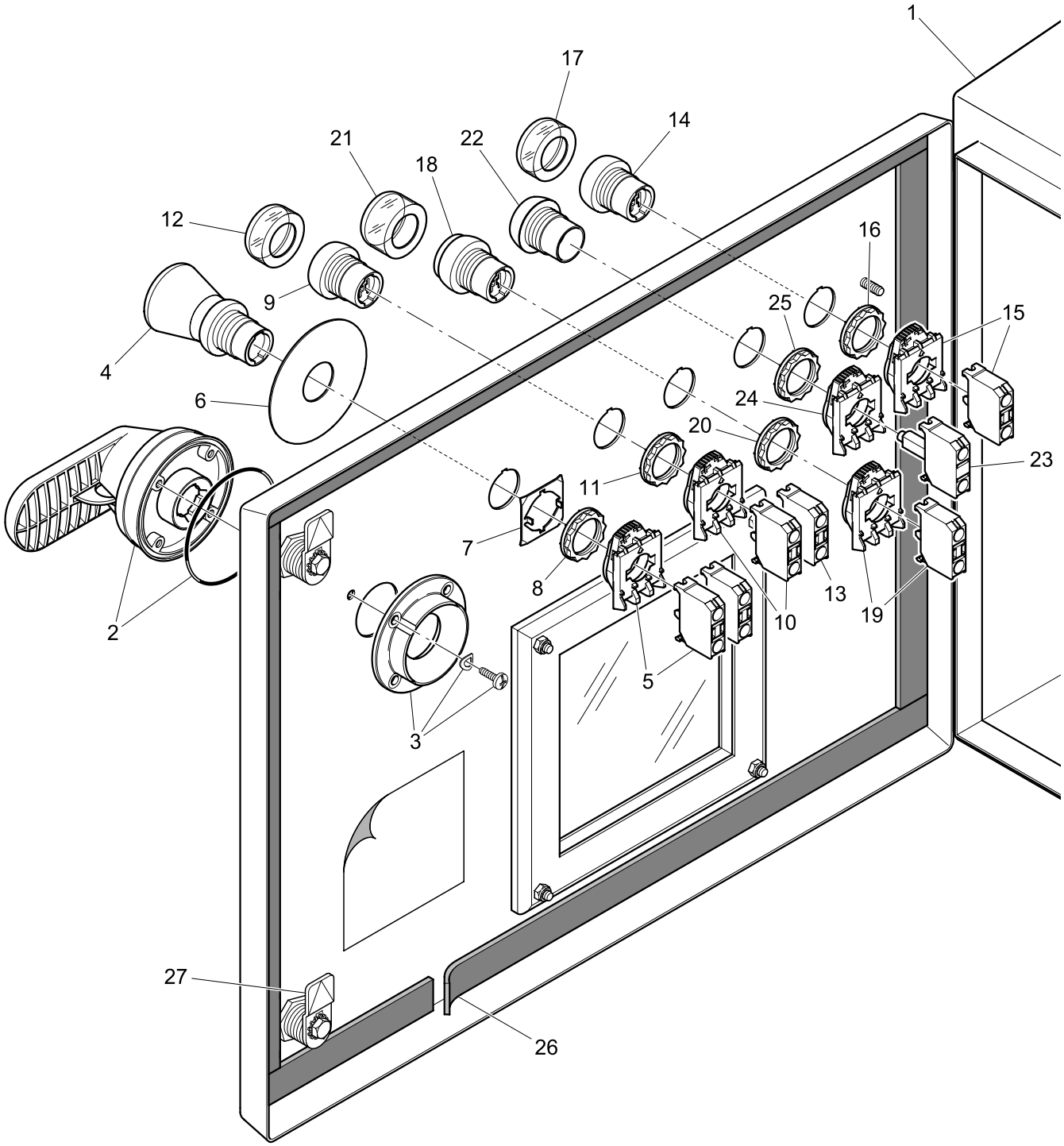
Manual Page Number	Revision
98-113	Parts, Electrical Assembly, 5 HP *(continued)*: The enclosure assembly currently in use is shown below and on the following pages. The electrical assembly parts list begins on the previous page.



Item	Quantity	Part Number and Description
–	1	**25780** - Electrical Enclosure Assembly, CC, 2–5 HP (includes items 1–19)
1	1	**25781** - Electrical Enclosure, CC, 2–5 HP
2	1	**21557** - Disconnect Switch, 3 pole, non-fusible, 40 amp (DISC 1)
3	2	**10415** - Round Head Machine Screw, with washer, 8-32 x 1/2"
4	1	**21559** - Disconnect Shaft, extended, 10.4" long
5	1	**21617** - Circuit Breaker, mini, 1 pole, 2 amp (MCB3, secondary)
6	2	**21837** - Contactor, 50 amp, 24 volt, 50/60 Hz coil (1M and 2M)
7	4	**21839** - Auxiliary Contact Block, front mount, normally open (for 1M and 2M)
8	2	**21840** - Auxiliary Contact Block, front mount, normally closed (for 1M and 2M)
9	1	**21841** - Overload Base Adapter, ABB T42 overload (for OL1)
10	1	**21857** - Remote Relay Reset Module, 24 VAC (for OL1)
11	1	**21883** - Safety Relay, SCR-31-i, Viper (SR1)
12	1	**21724** - Safety Monitor, 24 VAC (SM)
13	3	**21819** - Resistor, safety monitor
14	8	**21438** - Terminal Block
15	8	**21439** - End Anchor
16	2	**21442** - Grounding Block, size 4
17	2	**21443** - Grounding Block, size 10
18	1	**25782** - Electrical Enclosure Panel, CC, 2–5 HP
19	1	**25783** - Electrical Schematic, CC, 2–5 HP

Manual Page Number	Revision

98-113 Parts, Electrical Assembly, 5 HP *(continued)*: The enclosure assembly door parts currently in use are shown below and on the following page.



Item	Quantity	Part Number and Description
1	1	**25780** - Electrical Enclosure Assembly, CC, 2–5 HP (includes items 2–27)
2	1	**21560** - Disconnect Switch Handle (includes O-ring)
3	1	**21460** - Disconnect Rod Guide
–	1	**21763** - Push Button Assembly, E-Stop, 2 normally closed (includes items 4–8)
4	1	**21427** - Push Button, stop
5	2	**21429** - Contact Block, normally closed, with latch
6	1	**21428** - Legend Plate, yellow, round
7	1	**21578** - Washer, push button, anti-rotation
8	1	**21572** - Push Button Nut, metal
–	1	**21622** - Push Button Assembly, reset (includes items 9–12)
9	1	**21623** - Push Button, reset
10	1	**21430** - Contact Block, normally open, with latch
11	1	**21572** - Push Button Nut, metal
12	1	**21431** - Boot, push button
13	1	**21429** - Contact Block, normally closed, with latch
–	1	**21424** - Push Button Assembly, start (includes items 14–17)
14	1	**21425** - Push Button, start
15	1	**21430** - Contact Block, normally open, with latch
16	1	**21572** - Push Button Nut, metal
17	1	**21431** - Boot, push button
–	1	**21723** - Push Button Assembly, stop, standard (includes items 18–21)
18	1	**21487** - Push Button, stop
19	1	**21429** - Contact Block, normally closed, with latch
20	1	**21572** - Push Button Nut, metal
21	1	**21721** - Boot, extended, push button, A-B
–	1	**21648** - Pilot Light Assembly, 24 volt, green (includes items 22–25)
22	1	**21434** - Pilot Light
23	1	**21491** - Pilot Light Lamp Module, 24 volt
24	1	**21432** - Latch, push button
25	1	**21572** - Push Button Nut, metal
26	1	* - Door Gasket (fitting and adhesive required)
27	2	**21270** - Quarter Turn Latch Assembly (Industrial Enclosures)
	2	**21271** - Quarter Turn Latch Assembly (Hoffman Enclosures)

* Contact an Urschel representative.

Manual Page Number	Revision

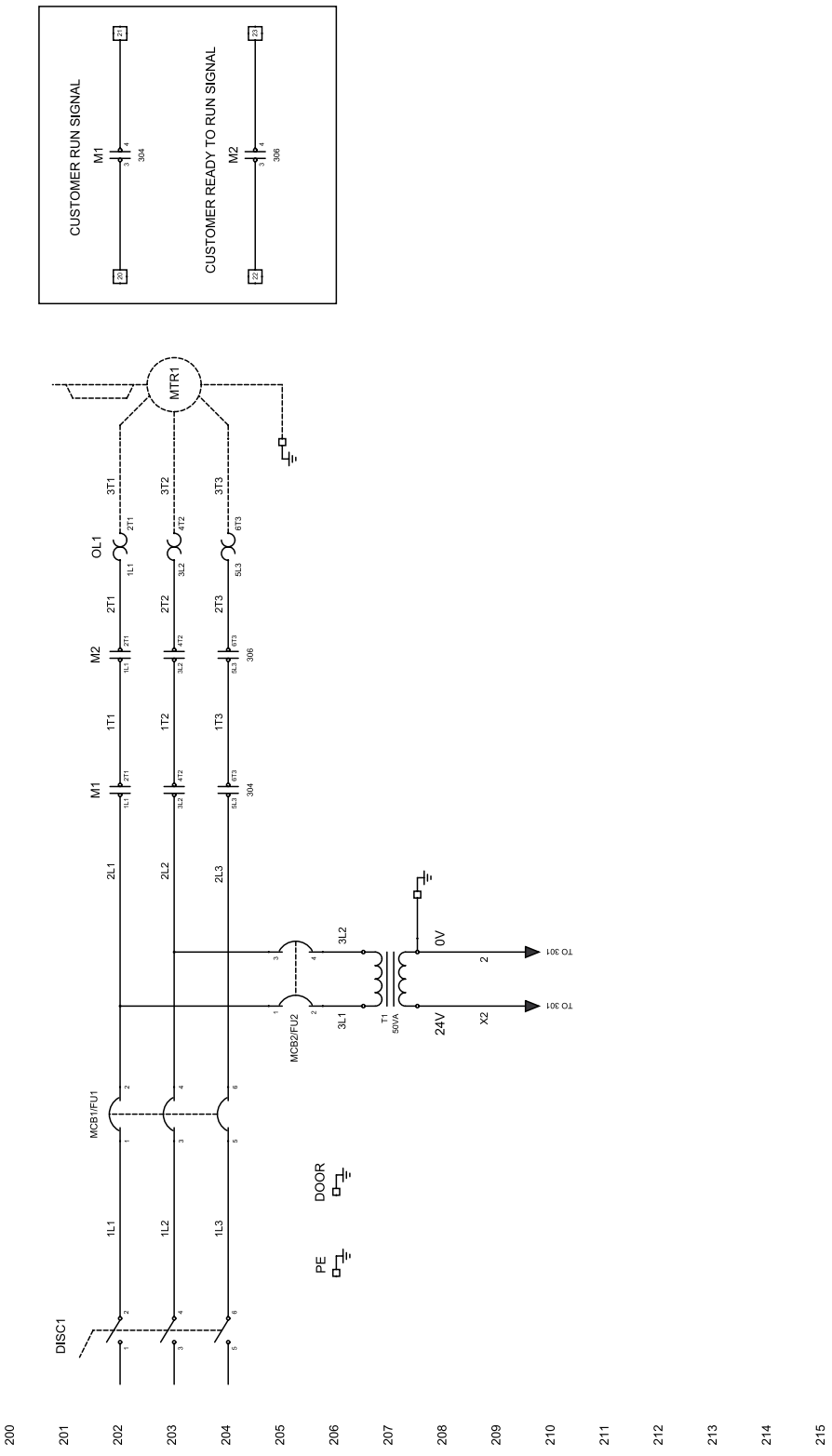
98-113 Parts, Electrical Schematic 25783: Use with electrical assembly and enclosure assembly shown on the previous pages.

PART # 25783

ELECTRICAL SCHEMATIC
(Sheet 2 of 3)

Note: Sheet 1 is not shown.

POWER CIRCUIT



Manual Page Number	Revision
98-113	Parts, Electrical Schematic 25783: Use with electrical assembly and enclosure assembly shown on the previous pages.

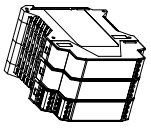
PART # 25783

ELECTRICAL SCHEMATIC (Sheet 5 of 5)

CONTROL CIRCUIT/SAFETY CONNECTIONS

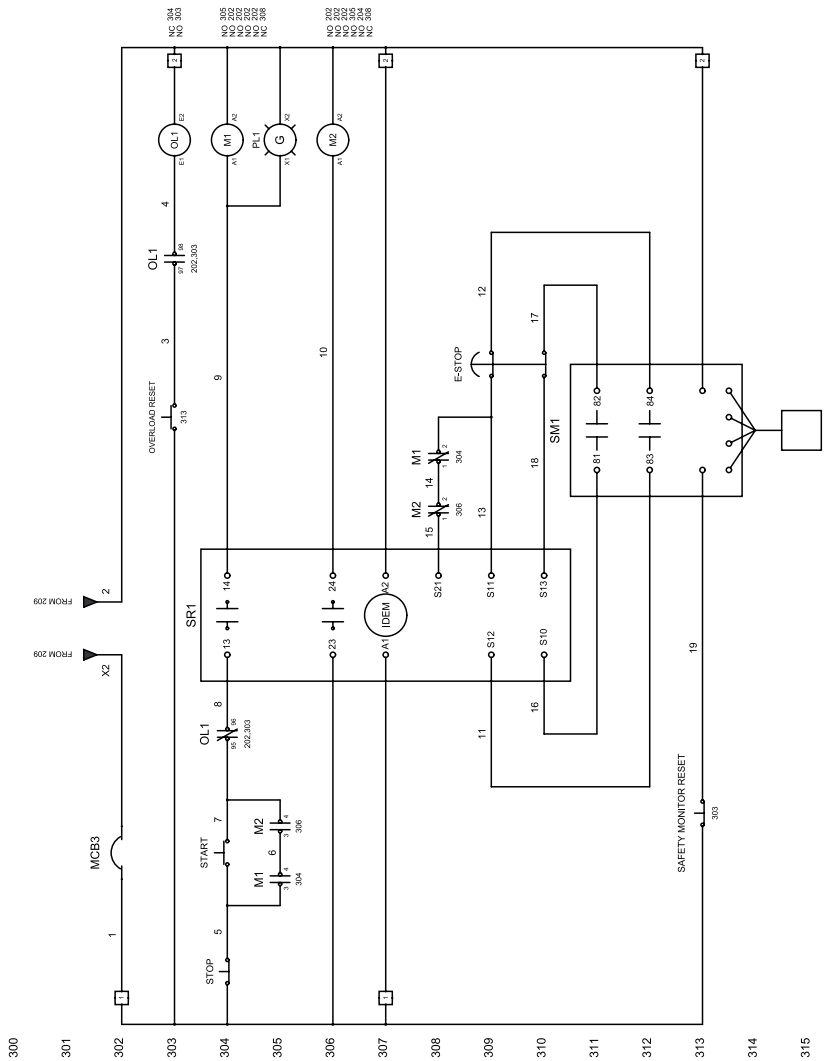
CONNECTION CHART: SM1 (FOR MODEL CC)

INPUT STATION NUMBER	SENSOR LOCATION
IN1	FEED HOPPER
IN2	LOWER DISCHARGE CHUTE
IN3	FRAME COVER
IN4	N/A
IN5	N/A
IN6	N/A



CONNECTION CHART: SM1 (FOR MODEL CC-D)

INPUT STATION NUMBER	SENSOR LOCATION
IN1	FEED HOPPER
IN2	FRAME COVER
IN3	N/A
IN4	N/A
IN5	N/A
IN6	N/A



Charts for machines with mini circuit breakers.

Motor Full Load Amperage	Overload Relay (OL1) Part Number
.74 - 1.00	21842
1.00 - 1.30	21843
1.30 - 1.70	21844
1.70 - 2.30	21845
2.30 - 3.10	21846
3.10 - 4.20	21847
4.20 - 5.70	21848
5.70 - 7.60	21849
7.60 - 10.00	21850
10.00 - 13.00	21851
13.00 - 16.00	21852
16.00 - 20.00	21853
20.00 - 24.00	21854
24.00 - 29.00	21855
29.00 - 35.00	21856

3 POLE MINI CIRCUIT BREAKER CHART (MCB1)		
Motor Full Load Amperage	MCB Part Number	Fuse Size (Amps)
0 - 1.71	21602	3
1.72 - 2.85	21603	5
2.86 - 3.42	21604	6
3.43 - 4.57	21605	8
4.58 - 5.71	21606	10
5.72 - 7.43	21632	13
7.44 - 8.57	21607	15
8.58 - 11.42	21608	20
11.43 - 14.28	21609	25
14.29 - 17.14	21610	30
17.15 - 22.00	*21611	40
20.01 - 28.00	*21889	50
28.01 - 34.00	*21890	60
34.01 - 36.00	*21891	63

* Use only at 240 volts or lower.

CONTROL CIRCUIT TRANSFORMER CHART USING MINI CIRCUIT BREAKERS							
Transformer Part Number	Primary Voltage	Primary MCB MCB2 (2 Pole)		Secondary MCB 110 volt MCB3 (1 Pole)		Secondary MCB 24 volt MCB3 (1 Pole)	
		Size	Part Number	Size	Part Number	Size	Part Number
12927	200-240	1.00	21613	.50	21615	2.00	21617
12928	380-415	.50	21612	.50	21615	2.00	21617
12927	440-480	.50	21612	.50	21615	2.00	21617

Charts for machines with fuses.

Motor Full Load Amperage	Overload Relay (OL1) Part Number
.74 - 1.00	21842
1.00 - 1.30	21843
1.30 - 1.70	21844
1.70 - 2.30	21845
2.30 - 3.10	21846
3.10 - 4.20	21847
4.20 - 5.70	21848
5.70 - 7.60	21849
7.60 - 10.00	21850
10.00 - 13.00	21851
13.00 - 16.00	21852
16.00 - 20.00	21853
20.00 - 24.00	21854
24.00 - 29.00	21855
29.00 - 35.00	21856

Motor Full Load Amperage	Cube Fuse (FU1) Part Number	Fuse Size
0 - 1.71	21384	3
1.72 - 3.42	21341	6
3.43 - 5.71	21339	10
5.72 - 8.57	21325	15
8.58 - 10.00	21326	17.5
10.01 - 11.42	21327	20
11.43 - 14.28	21328	25
14.29 - 17.14	21329	30
17.15 - 20.00	21330	35
20.01 - 22.85	21331	40
22.86 - 25.71	21332	45
25.72 - 28.57	21333	50
28.58 - 32.00	21334	60

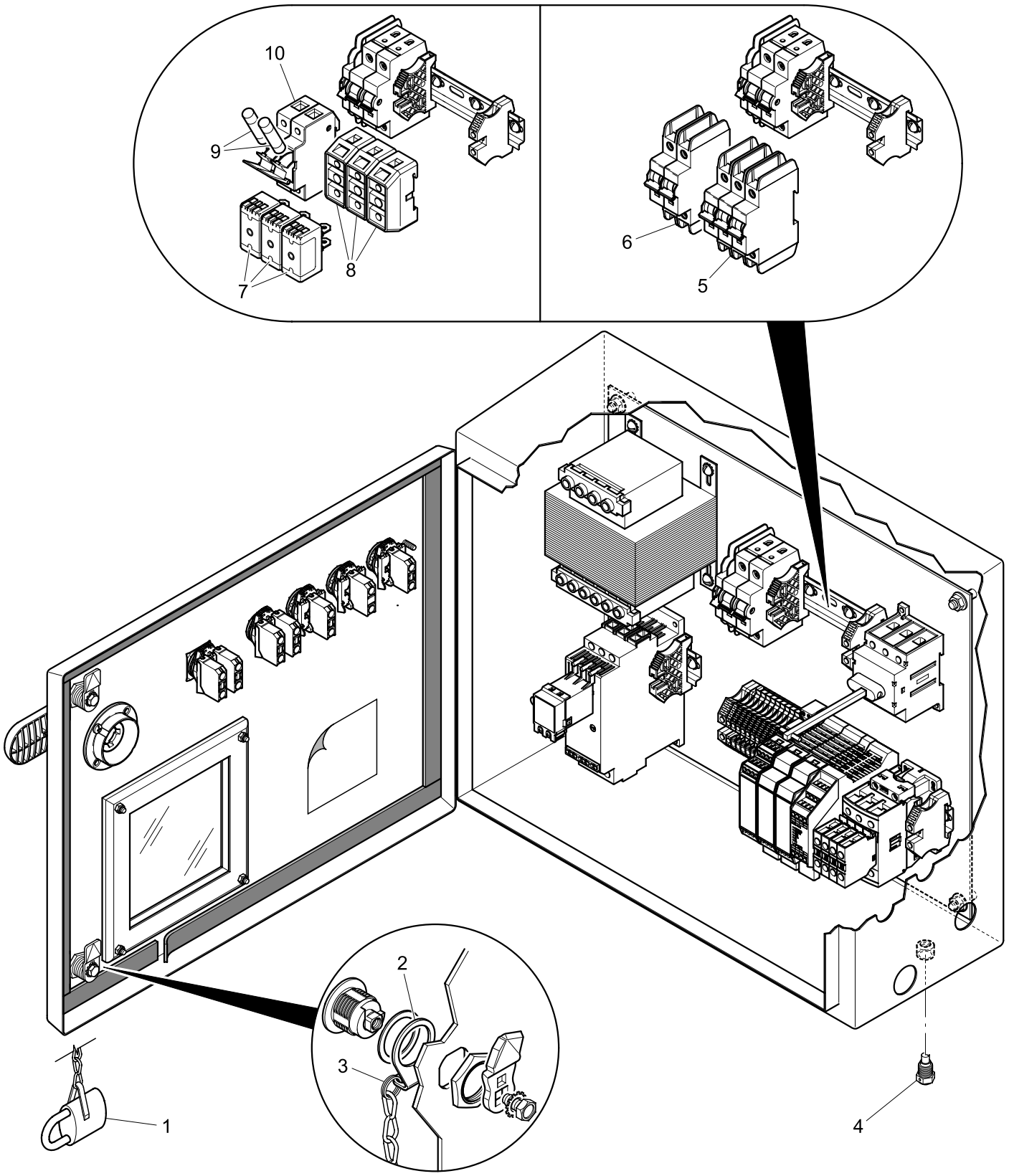
Where Used	Transformer Part Number	Primary Voltage	Primary Fuse (FU2)		Secondary Fuse (FU3) 24 volt	
			Size	Part Number	Size	Part Number
N. America	12927	200-240	1.00	12925	2.50	12922
Elsewhere	12927	200-240	1.00	12929	2.50	12922
N. America	12927	440-480	.50	12926	2.50	12922
Elsewhere	12928	380-415	.50	12924	2.50	12922
N. America	21310	575	.40	21509	2.50	12922

This page intentionally left blank.

Manual Page Number	Revision

98-113 Parts, Electrical Assembly, 10 HP: The electrical assembly and enclosure assembly currently in use are shown below and on the following pages.

*Current assemblies are supplied with **fuses or mini circuit breakers (MCB)**. See the information in this addendum to determine which device is appropriate for your machine.*

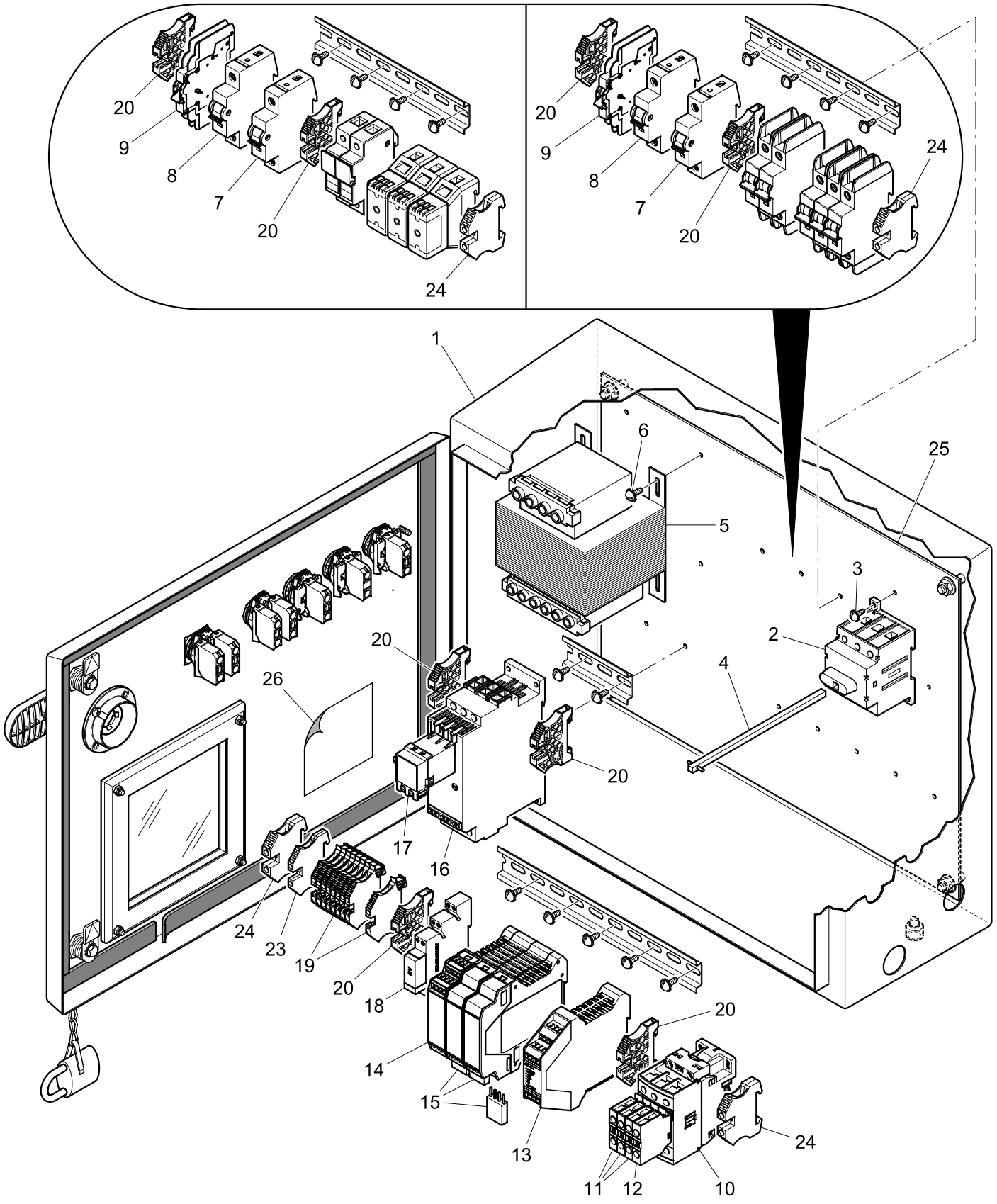


Item	Quantity	Part Number and Description
–	1	**25801** - Electrical Assembly, CC-D, 10 HP, soft start (includes items 1–10)
1	1	**13408** - Padlock With Chain
2	1	**21778** - Padlock Retainer
3	1	**21499** - Split Ring, s.s.
4	1	**11593** - Breather/Drain 1/4"
Short Circuit Protective Device (SCPD), choose circuit breakers (items 5–6) or fuses (items 7–10).		
5	1	***** - Circuit Breaker, mini, 3 pole (MCB1, main)
6	1	***** - Circuit Breaker, mini, 2 pole (MCB2, primary)
7	3	***** - Fuse, cube (FU1, main)
8	3	**21324** - Fuse Base, 60 amp, cube (for FU1)
9	2	***** - Fuse (FU2, primary)
10	1	**12930** - Modular Fuse Holder, 2 pole (for FU2)

***** See Short Circuit Protective Device (SCPD) Charts on the following pages.
Electrical assemblies also include the Safety Switches and Enclosure Fittings. See the following pages.

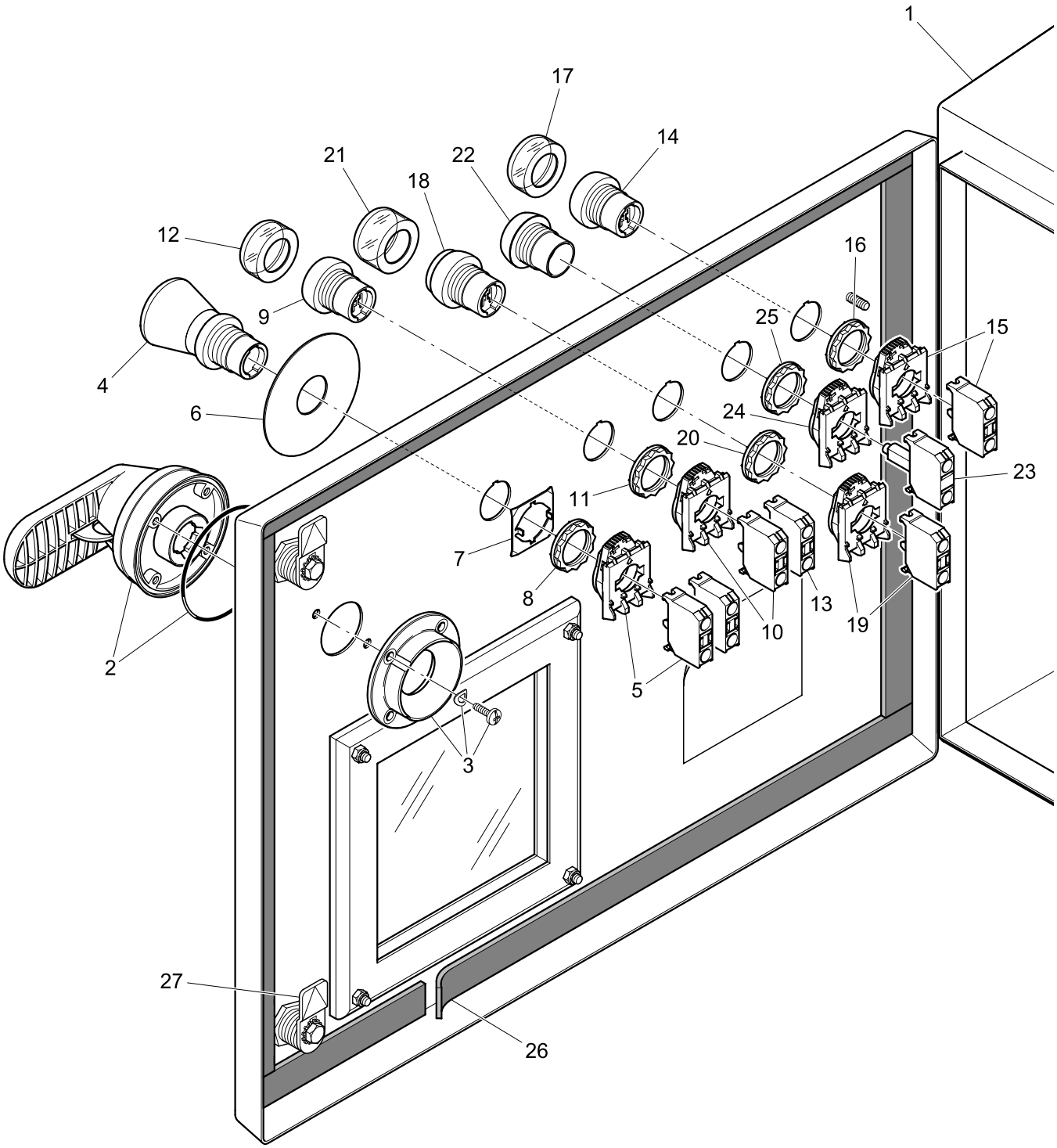
Manual Page Number	Revision

98-113 Parts, Electrical Assembly, 10 HP *(continued)*: The enclosure assembly currently in use is shown below and on the following pages. The electrical assembly parts list begins on the previous page.



Item	Quantity	Part Number and Description
–	1	**25785** - Electrical Enclosure Assembly, CC, 10 HP, soft start (includes items 1–26)
1	1	**25786** - Electrical Enclosure, CC, 10 HP, soft start
2	1	**21557** - Disconnect Switch, 3 pole, non-fusible, 40 amp (DISC 1)
3	2	**10415** - Round Head Machine Screw, with washer, 8-32 x 1/2"
4	1	**21559** - Disconnect Shaft, extended, 10.4" long
5	1	**21747** - Control Circuit Transformer, 250 VA (CCT)
6	4	**10625** - Round Head Machine Screw, with washer, 10-32 x 1/2"
7	1	**21785** - Circuit Breaker, mini, 1 pole, 12 amp (MCB3, secondary)
8	1	**21618** - Circuit Breaker, mini, 1 pole, 3 amp (MCB4, secondary)
9	1	**21715** - Auxiliary Trip Contact, Eaton, MCB (for MCB4)
10	1	**21838** - Contactor, 60 amp, 24 volt, 50/60 Hz coil (1M)
11	3	**21839** - Auxiliary Contact Block, front mount, normally open (for 1M)
12	1	**21840** - Auxiliary Contact Block, front mount, normally closed (for 1M)
13	1	**21883** - Safety Relay, SCR-31-i, Viper (SR1)
14	1	**21724** - Safety Monitor, 24 VAC (SM)
15	3	**21819** - Resistor, safety monitor
16	1	**21596** - Soft Start Controller, 37 amp (SS)
17	1	**21601** - Soft Start Overload Reset Solenoid
18	1	**21666** - Control Relay, 1/2" wide, 24 volt (CR1)
19	9	**21438** - Terminal Block
20	6	**21439** - End Anchor
23	1	**21442** - Grounding Block, size 4
24	3	**21443** - Grounding Block, size 10
25	1	**25787** - Electrical Panel, CC, CC-D, 10 HP, soft start
26	1	**25788** - Electrical Schematic, CC, CC-D, 10 HP, soft start

Manual Page Number	Revision
98-113	Parts, Electrical Assembly, 10 HP *(continued)*: The enclosure assembly door parts currently in use are shown below and on the following page.



Item	Quantity	Part Number and Description
1	1	**25785** - Electrical Enclosure, CC, 10 HP, soft start (includes items 1–27)
2	1	**21560** - Disconnect Switch Handle (includes O-ring)
3	1	**21460** - Disconnect Rod Guide
–	1	**21763** - Push Button Assembly, E-Stop, 2 normally closed (includes items 4–8)
4	1	**21427** - Push Button, stop
5	2	**21429** - Contact Block, normally closed, with latch
6	1	**21428** - Legend Plate, yellow, round
7	1	**21578** - Washer, push button, anti-rotation
8	1	**21572** - Push Button Nut, metal
–	1	**21622** - Push Button Assembly, reset (includes items 9–12)
9	1	**21623** - Push Button, reset
10	1	**21430** - Contact Block, normally open, with latch
11	1	**21572** - Push Button Nut, metal
12	1	**21431** - Boot, push button
13	1	**21429** - Contact Block, normally closed, with latch
–	1	**21424** - Push Button Assembly, start (includes items 14–17)
14	1	**21425** - Push Button, start
15	1	**21430** - Contact Block, normally open, with latch
16	1	**21572** - Push Button Nut, metal
17	1	**21431** - Boot, push button
–	1	**21723** - Push Button Assembly, stop, standard (includes items 18–21)
18	1	**21487** - Push Button, stop
19	1	**21429** - Contact Block, normally closed, with latch
20	1	**21572** - Push Button Nut, metal
21	1	**21721** - Boot, extended, push button, A-B
–	1	**21648** - Pilot Light Assembly, 24 volt, green (includes items 22–25)
22	1	**21434** - Pilot Light
23	1	**21491** - Pilot Light Lamp Module, 24 volt
24	1	**21432** - Latch, push button
25	1	**21572** - Push Button Nut, metal
26	1	***** - Door Gasket (fitting and adhesive required)
27	2	**21270** - Quarter Turn Latch Assembly (Industrial Enclosures)
	2	**21271** - Quarter Turn Latch Assembly (Hoffman Enclosures)

***** Contact an Urschel representative.

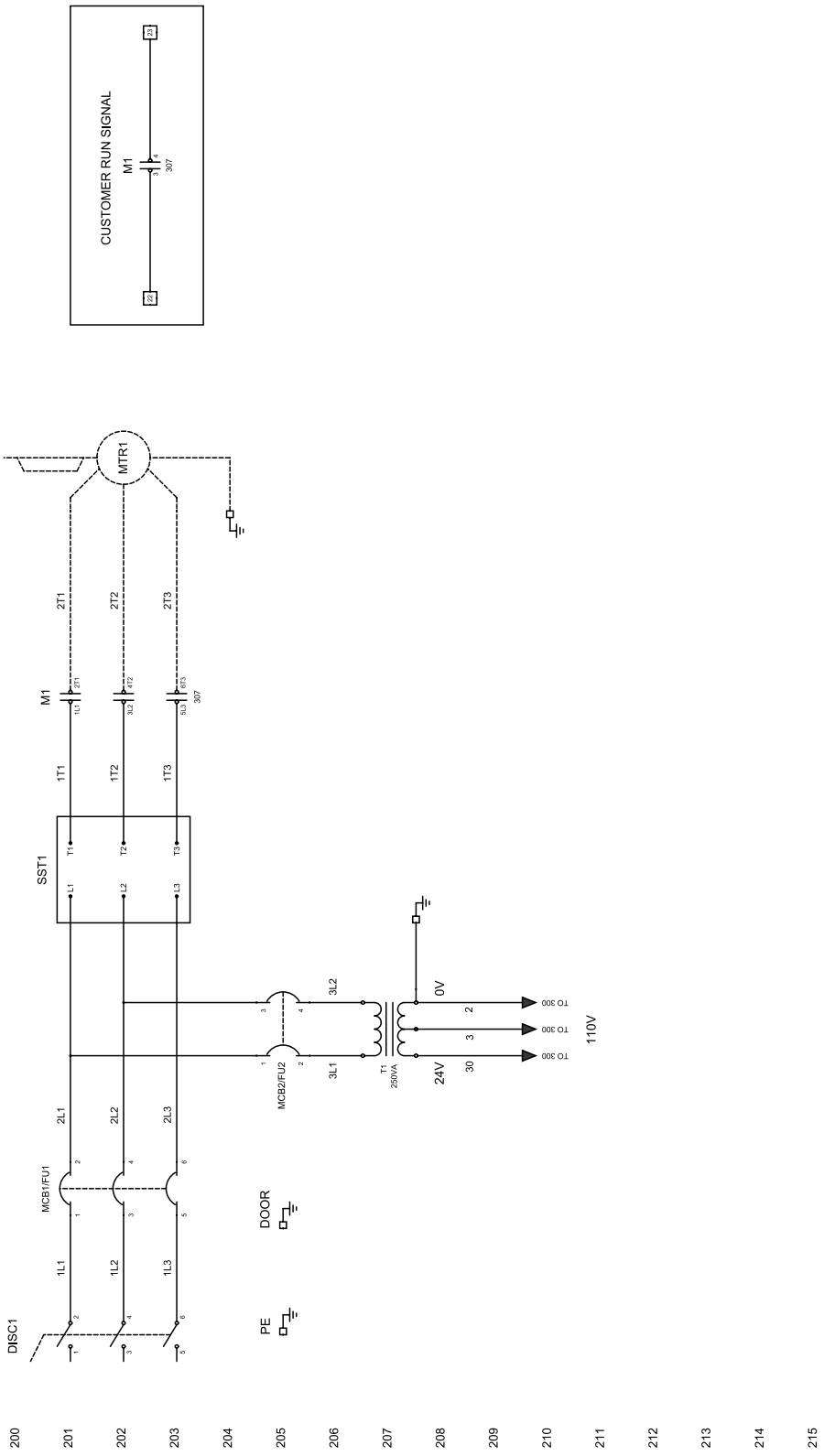
Manual Page Number	Revision

98-113 Parts, Electrical Schematic 25788: Use with electrical assembly and enclosure assembly shown on the previous pages.

PART # 25788

ELECTRICAL SCHEMATIC
(Sheet 2 of 3)

Note: Sheet 1 is not shown.

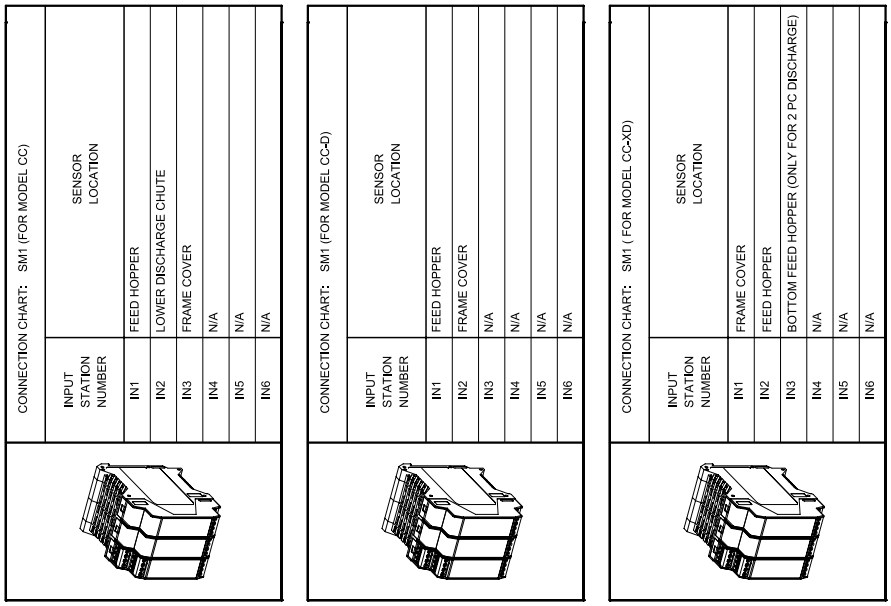


Manual Page Number	Revision
98-113	Parts, Electrical Schematic 25788: Use with electrical assembly and enclosure assembly shown on the previous pages.

PART # 25788

ELECTRICAL SCHEMATIC (Sheet 5 of 5)

CONTROL CIRCUIT/SAFETY CONNECTIONS



CONNECTION CHART: SM1 (FOR MODEL CC)	
INPUT STATION NUMBER	SENSOR LOCATION
IN1	FEED HOPPER
IN2	LOWER DISCHARGE CHUTE
IN3	FRAME COVER
IN4	N/A
IN5	N/A
IN6	N/A

CONNECTION CHART: SM1 (FOR MODEL CC-D)	
INPUT STATION NUMBER	SENSOR LOCATION
IN1	FEED HOPPER
IN2	FRAME COVER
IN3	N/A
IN4	N/A
IN5	N/A
IN6	N/A

CONNECTION CHART: SM1 (FOR MODEL CC-XD)	
INPUT STATION NUMBER	SENSOR LOCATION
IN1	FRAME COVER
IN2	FEED HOPPER
IN3	BOTTOM FEED HOPPER (ONLY FOR 2 PC DISCHARGE)
IN4	N/A
IN5	N/A
IN6	N/A

Charts for machines with mini circuit breakers.

3 POLE MINI CIRCUIT BREAKER CHART (MCB1)		
Motor Full Load Amperage	MCB Part Number	Fuse Size (Amps)
0 - 1.71	21602	3
1.72 - 2.85	21603	5
2.86 - 3.42	21604	6
3.43 - 4.57	21605	8
4.58 - 5.71	21606	10
5.72 - 7.43	21632	13
7.44 - 8.57	21607	15
8.58 - 11.42	21608	20
11.43 - 14.28	21609	25
14.29 - 17.14	21610	30
17.15 - 22.00	*21611	40
20.01 - 28.00	*21889	50
28.01 - 34.00	*21890	60
34.01 - 36.00	*21891	63

* Use only at 240 volts or lower.

CONTROL CIRCUIT TRANSFORMER CHART USING MINI CIRCUIT BREAKERS							
Transformer Part Number	Primary Voltage	Primary MCB MCB2 (2 Pole)		Secondary MCB 24 volt MCB3 (1 Pole)		Secondary MCB 110 volt MCB4 (1 Pole)	
		Size	Part Number	Size	Part Number	Size	Part Number
21747	200-240	4.0	21635	12.0	21785	3.0	21618
21747	380-415	3.0	21628	12.0	21785	3.0	21618
21747	440-480	2.0	21614	12.0	21785	3.0	21618

Charts for machines with fuses.

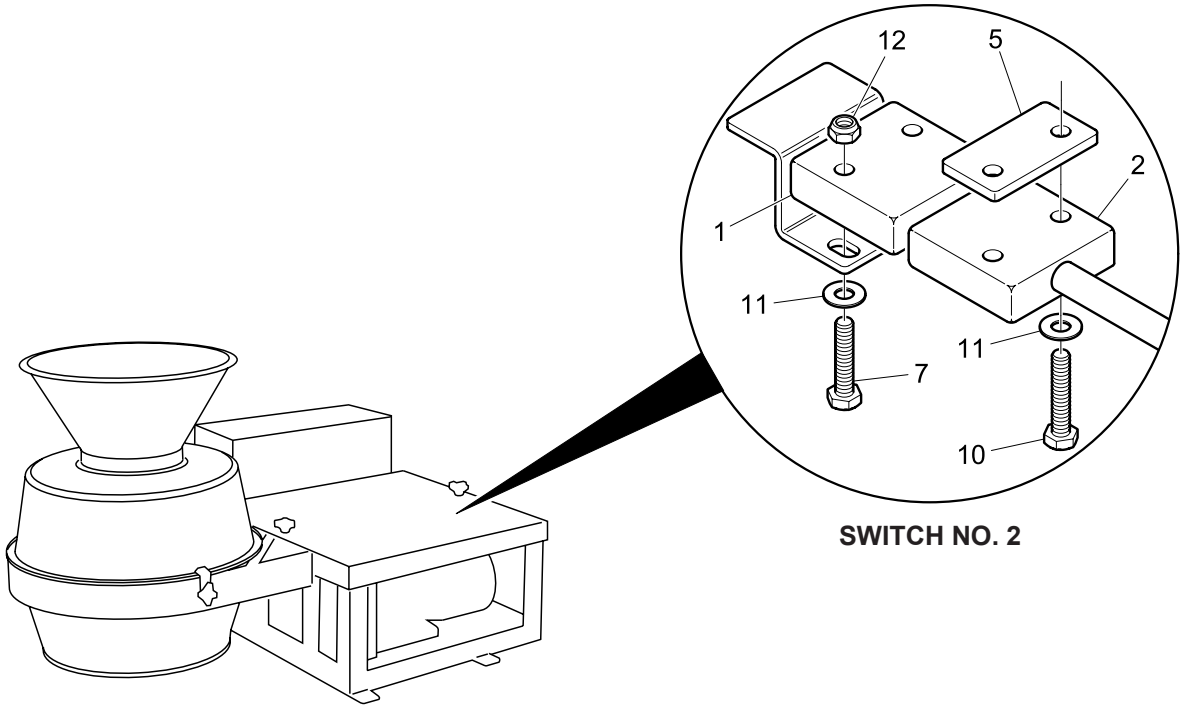
Motor Full Load Amperage	Cube Fuse (FU1) Part Number	Fuse Size
0 - 1.71	21384	3
1.72 - 3.42	21341	6
3.43 - 5.71	21339	10
5.72 - 8.57	21325	15
8.58 - 10.00	21326	17.5
10.01 - 11.42	21327	20
11.43 - 14.28	21328	25
14.29 - 17.14	21329	30
17.15 - 20.00	21330	35
20.01 - 22.85	21331	40
22.86 - 25.71	21332	45
25.72 - 28.57	21333	50
28.58 - 32.00	21334	60

Where Used	Transformer Part Number	Primary Voltage	Primary Fuse (FU2)		Secondary Fuse (FU3) 24 volt		Secondary Fuse (FU4) 110-120 volt	
			Size	Part Number	Size	Part Number	Size	Part Number
N. America	21747	200-240	4.0	12948	12.0	21762	2.5	12922
Elsewhere	21747	200-240	4.0	12948	12.0	21762	2.5	12922
Elsewhere	21747	380-415	3.0	21347	12.0	21762	2.5	12922
N. America	21747	440-480	2.0	12699	12.0	21762	2.5	12922
Canada	21747	575	2.0	12699	12.0	21762	2.5	12922

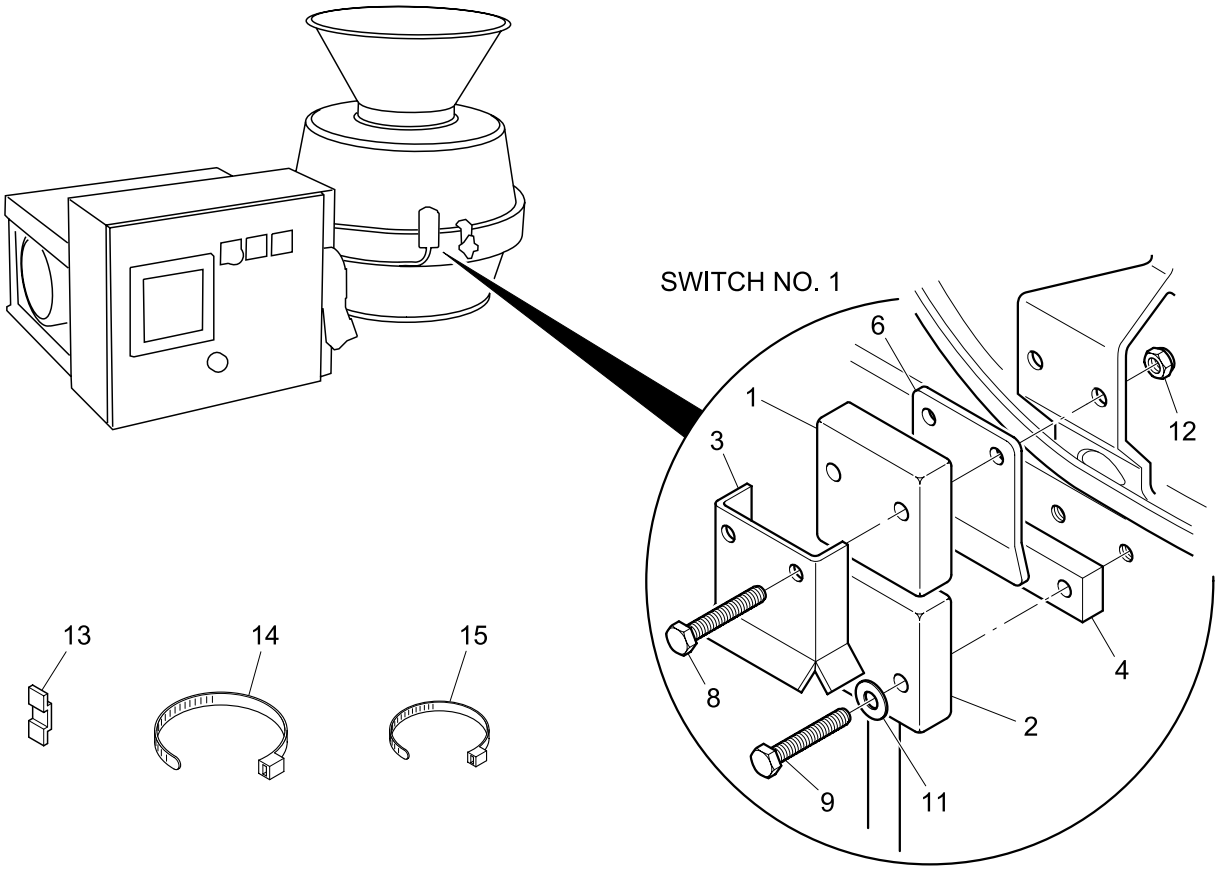
This page intentionally left blank.

Manual Page Number	Revision

98-113 Parts, Electrical Assembly, Switches: The safety switches currently supplied on the machine are shown below and on the following page.



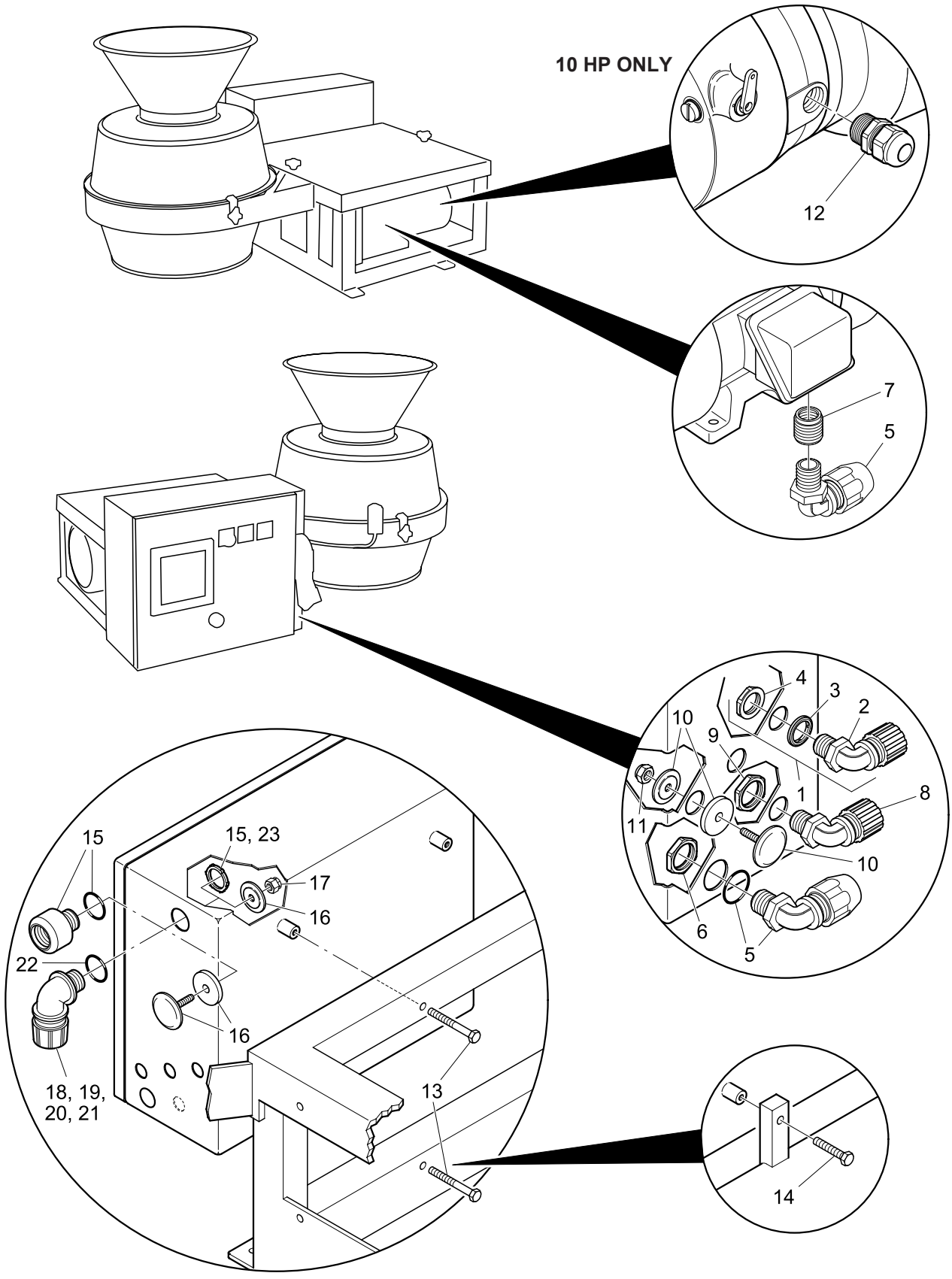
SWITCH NO. 2



Item	Quantity	Part Number and Description
Electrical assemblies include the following parts:		
1	2	**63741** - Actuator
2	2	**63738** - Sensor, 6' lead
3	1	**63133** - Alignment Bracket
4	1	**12807** - Spacer, 1/2" (12.7 mm)
5	1	**12801** - Spacer, 1/8" (3.2 mm)
6	1	**22935** - Spacer, actuator bracket, CC-D
7	2	**10351** - Hex Head Cap Screw, 10-24 x 7/8", s.s.
8	2	**10233** - Hex Head Cap Screw, 10-24 x 1", s.s.
9	2	**10422** - Hex Head Cap Screw, 10-24 x 1-1/4", s.s., Nylok
10	2	**10420** - Hex Head Cap Screw, 10-24 x 1", s.s., Nylok
11	6	**10006** - Washer, flat, #10, s.s., thin
12	4	**10231** - Hex Nut, 10-24, s.s., locking
13	9	**13465** - Cable Tie Clip
14	11	**11513** - Cable Tie
15	10	**11534** - Cable Tie, small, 99 mm long

Manual Page Number	Revision

98-113 Parts, Electrical Assembly, Enclosure Fittings: The enclosure fittings currently supplied on the machine are shown below and on the following page.

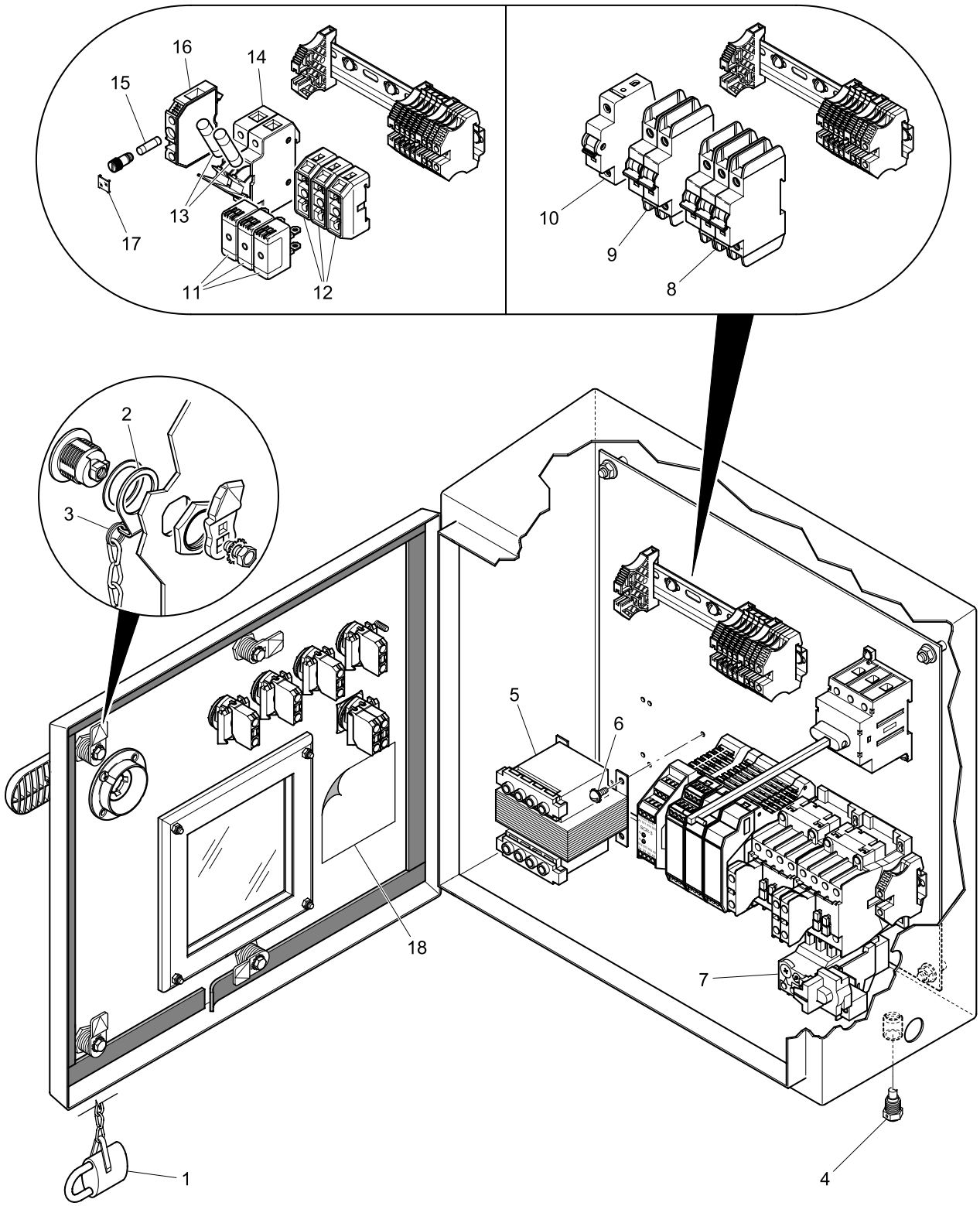


Item	Quantity	Part Number and Description
Electrical assemblies include the following parts:		
1	2	**11548** - Cord Connector, 90 degree, .250"/.375" (includes items 2–4)
2	1	**11609** - Cord Connector, 90 degree, .250"/.375"
3	1	**11900** - Seal Washer, 3/16" x 7/8" x 1-9/32"
4	1	**11611** - Lock Nut, 1/2"
5	2	**11614** - Conduit Connector, 90 degree, 1/2"
	2	**11616** - Conduit Connector, 90 degree, 3/4" (10 hp motor only)
6	1	**11611** - Lock Nut, 1/2"
	1	**11970** - Lock Nut, 3/4", NPT (10 hp motor only)
7	1	**11502** - Reducing Bushing, 1/2" x 3/4"
	1	**11505** - Reducing Bushing, 3/4" x 1" (10 hp motor only)
8	1	**21661** - Cord Connector, 90 degree, 3/4", .375"/.500" (10 hp motor only)
9	1	**11970** - Lock Nut, 3/4", NPT (10 hp motor only)
10	1	**11553** - Hole Seal, 7/8"
11	1	**10231** - Hex Nut, 10-24, s.s., locking
12	1	**11877** - Cord Connector, straight, .236"/.472" (10 hp motor only)
13	4	**10053** - Hex Head Cap Screw, 5/16-18 x 2-1/2", s.s. (quantity is 2 for 10 hp motor)
14	2	**10048** - Hex Head Cap Screw, 5/16-18 x 1-1/4", s.s. (10 hp motor only)
Items below are not included with the electrical assembly; use at the power source entry point.		
15	1	**11582** - Conduit Hub, 1" (includes washer and lock nut)
16	1	**11591** - Hole Seal, 1-3/8"
17	1	**10231** - Hex Nut, 10-24, s.s., locking
–	1	**11626** - Cord Connector Assembly, 90 degree, .437"/.562" (includes items 18, 22, 23)
18	1	**11625** - Cord Connector, 90 degree, .437"/.562"
–	1	**21370** - Cord Connector Assembly, 90 degree, .62"/.75" (includes items 19, 22, 23)
19	1	**21368** - Cord Connector, 90 degree, .63"/.75"
–	1	**21371** - Cord Connector Assembly, 90 degree, .75"/.88" (includes items 20, 22, 23)
20	1	**21369** - Cord Connector, 90 degree, .75"/.88"
–	1	**21372** - Cord Connector Assembly, 90 degree, .88"/1.00" (includes items 21, 22, 23)
21	1	**11972** - Cord Connector, 90 degree, .88"/1.00"
22	1	**11966** - Seal Washer, 3/16" x 1-5/16" x 1-3/4"
23	1	**11624** - Lock Nut

Manual Page Number	Revision

98-113 Parts, Electrical Assembly, 5 hp: Repair parts for the previous assembly and enclosure are shown below and on the following pages.

*Current assemblies are supplied with **fuses or mini circuit breakers (MCB)**. See the information in this addendum to determine which device is appropriate for your machine.*

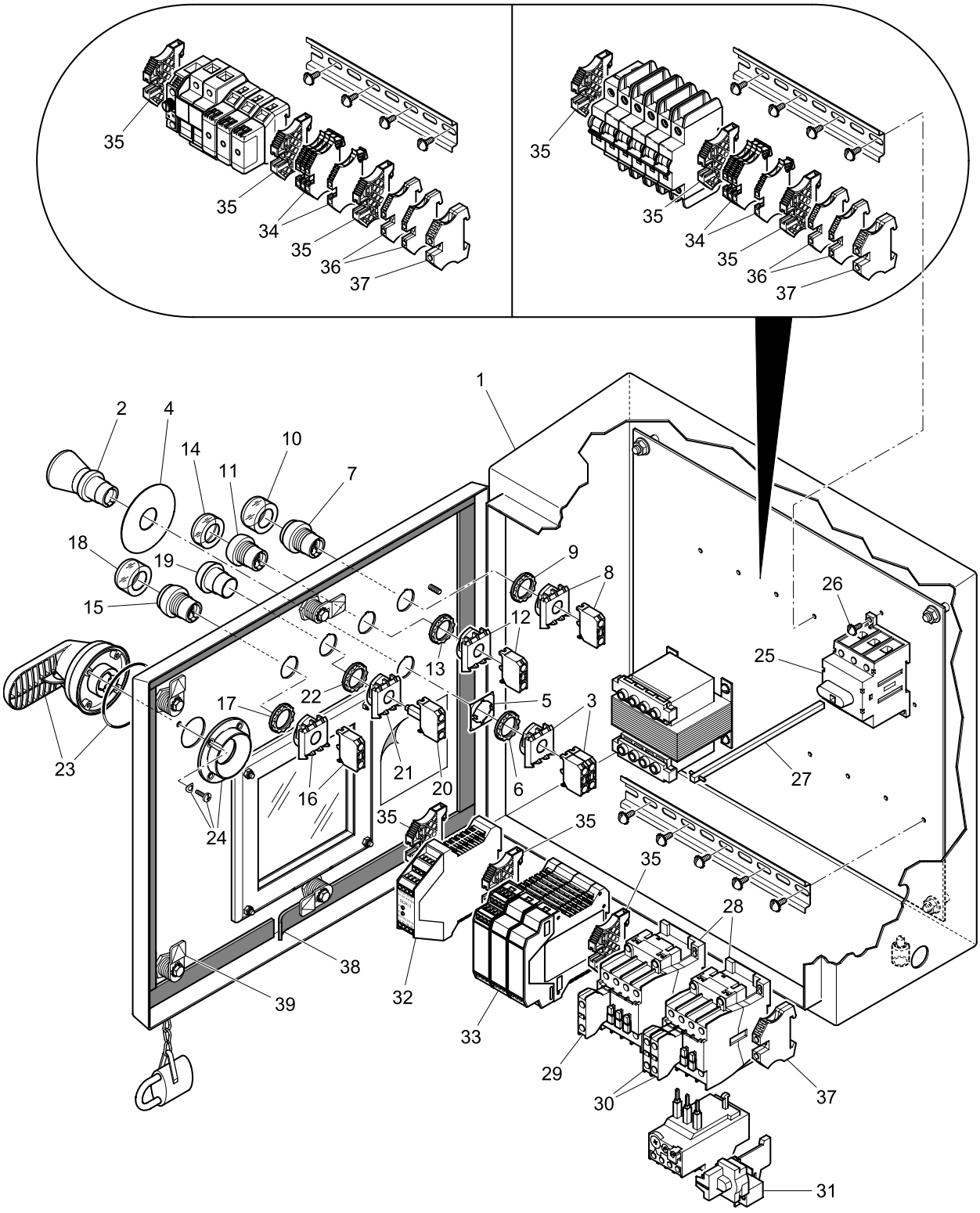


Item	Quantity	Part Number and Description
–	1	**25606*** - Electrical Assembly, CC-D, 5 hp (includes items 1–17)
1	1	**13408** - Padlock With Chain
2	1	**21778** - Padlock Retainer
3	1	**21499** - Split Ring, s.s.
4	1	**11593** - Breather/Drain 1/4"
5	1	** - Control Circuit Transformer, 50 VA
6	4	**10625** - Round Head Machine Screw, with washer, 10-32 x 1/"
7	1	** - Overload Relay (OL1)
Short Circuit Protective Device (SCPD), choose circuit breakers (items 8–10) or fuses (items 11–17).		
8	1	** - Circuit Breaker, mini, 3 pole (MCB1, main)
9	1	** - Circuit Breaker, mini, 2 pole (MCB2, primary)
10	1	**21617** - Circuit Breaker, mini, 1 pole, 2 amp (MCB3, secondary)
11	3	** - Fuse, cube (FU1, main)
12	3	**21349** - Fuse Base, 30 amp, cube (for FU1)
13	2	** - Fuse (FU2, primary)
14	1	**12930** - Modular Fuse Holder, 2 pole (for FU2)
15	1	**12922** - Fuse, 2.50 amp (FU3, secondary)
16	1	**12763** - Fuse Terminal, 5 x 20mm, IEC (for FU3, includes item 17)
17	1	**12781** - Transparent Cover
18	1	**25607** - Wiring Diagram, CC-D, 5

* Not for sale. Part numbers supplied for reference only.
** See Short Circuit Protective Device (SCPD) Charts on the following pages.
Electrical assemblies also include the Safety Switches and Enclosure Fittings. See the following pages.

Manual Page Number	Revision

98-113 Parts, Electrical Assembly, 5 hp *(continued)*: Repair parts for the previous assembly and enclosure are shown below and on the following pages. The assembly parts list begins on the previous page.



Item	Quantity	Part Number and Description
1	1	**25600*** - Electrical Enclosure, CC, 2-5 hp (includes items 1–39)
–	1	**21763** - Push Button Assembly, E-Stop, 2 normally closed (includes items 2–6)
2	1	**21427** - Push Button, stop
3	2	**21429** - Contact Block, normally closed, with latch
4	1	**21428** - Legend Plate, yellow, round
5	1	**21578** - Washer, push button, anti-rotation
6	1	**21572** - Push Button Nut, metal
–	1	**21622** - Push Button Assembly, reset (includes items 7–10)
7	1	**21623** - Push Button, reset
8	1	**21430** - Contact Block, normally open, with latch
9	1	**21572** - Push Button Nut, metal
10	1	**21431** - Boot, push button
–	1	**21424** - Push Button Assembly, start (includes items 11–14)
11	1	**21425** - Push Button, start
12	1	**21430** - Contact Block, normally open, with latch
13	1	**21572** - Push Button Nut, metal
14	1	**21431** - Boot, push button
–	1	**21723** - Push Button Assembly, stop, std (includes items 15–18)
15	1	**21487** - Push Button, stop
16	1	**21429** - Contact Block, normally closed, with latch
17	1	**21572** - Push Button Nut, metal
18	1	**21721** - Boot, extended, push button, A-B
–	1	**21648** - Pilot Light Assembly, 24 volt, green (includes items 19–22)
19	1	**21434** - Pilot Light
20	1	**21491** - Pilot Light Lamp Module, 24 volt
21	1	**21432** - Latch, push button
22	1	**21572** - Push Button Nut, metal
23	1	**21560** - Disconnect Switch Handle (includes O-ring)
24	1	**21460** - Disconnect Rod Guide
25	1	**21557** - Disconnect Switch, 3 pole, non-fusible, 40 amp (DISC 1)
26	2	**10415** - Round Head Machine Screw, with washer, 8-32 x 1/2"
27	1	**21559** - Disconnect Shaft, extended, 10.4" long
28	2	**21488** - Contactor, 26 amp, 24 volt coil (1M and 2M)
29	1	**21468** - Auxiliary Contact, ABB, normally open (for 1M)
30	2	**21469** - Auxiliary Contact, ABB, normally closed (for 2M)
31	1	**21752** - Remote Overload Reset Coil, 24 volt (for 2M)
32	1	**21634** - Safety Relay
33	1	**21724** - Safety Amplifier, 24 VAC
34	4	**21438** - Terminal Block
35	6	**21439** - End Anchor
36	2	**21442** - Grounding Block, size 4
37	2	**21443** - Grounding Block, size 10
38	1	****** - Door Gasket (fitting and adhesive required)
39	4	**21270** - Quarter Turn Latch (Industrial Enclosures)
	4	**21271** - Quarter Turn Latch (Hoffman Enclosures)

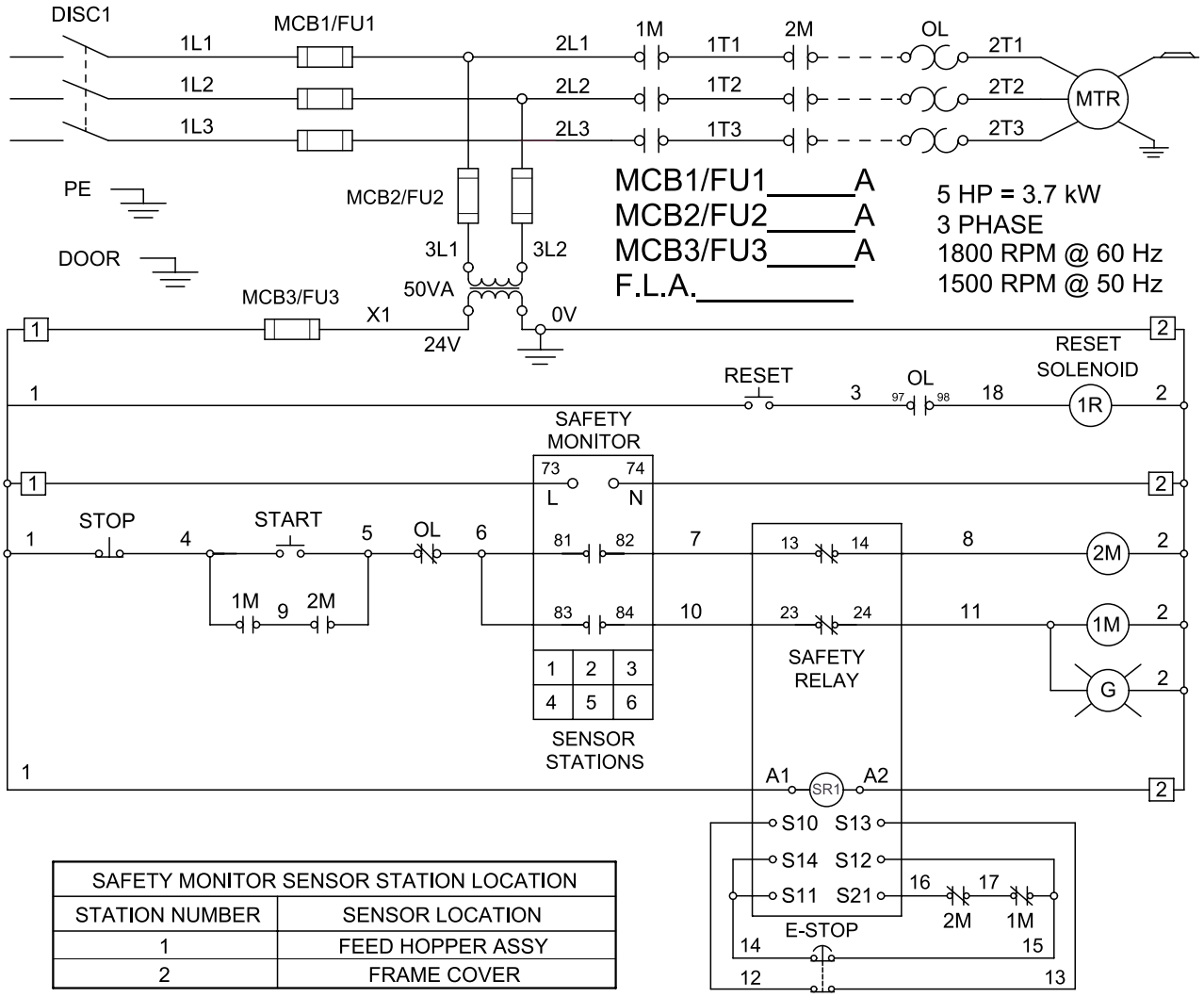
* Not for sale. Part numbers supplied for reference only.
** Consult the company.

Manual Page Number	Revision

98-113 Parts, Wiring Diagram 25607: Use with the electrical assemblies and enclosure shown on the previous pages.

WIRING DIAGRAM

PART # 25607



SAFETY MONITOR SENSOR STATION LOCATION	
STATION NUMBER	SENSOR LOCATION
1	FEED HOPPER ASSY
2	FRAME COVER

Charts for machines with mini circuit breakers.

Motor Full Load Amperage	Overload Relay (OL1) Part Number
.4 - .63	21543
.63 - .99	21446
1.00 - 1.29	21447
1.30 - 1.69	21448
1.70 - 2.19	21449
2.20 - 2.79	21450
2.80 - 3.49	21451
3.50 - 4.49	21452
4.50 - 5.99	21453
6.00 - 7.49	21454
7.50 - 9.99	21455
10.00 - 12.99	21456
13.00 - 17.99	21457
18.00 - 23.99	21458
24.00 - 32.00	21459

3 POLE MINI CIRCUIT BREAKER CHART (MCB1)		
Motor Full Load Amperage	"MCB" Part Number	Fuse Size (Amps)
0 - 1.71	21602	3
1.72 - 2.85	21603	5
2.86 - 3.42	21604	6
3.43 - 4.57	21605	8
4.58 - 5.71	21606	10
5.72 - 7.43	21632	13
7.44 - 8.57	21607	15
8.58 - 11.42	21608	20
11.43 - 14.28	21609	25
14.29 - 17.14	21610	30
17.15 - 20.00	21611	40

CONTROL CIRCUIT TRANSFORMER CHART USING MINI CIRCUIT BREAKERS							
Transformer Part Number	Primary Voltage	Primary MCB MCB2 (2 Pole)		Secondary MCB 110 volt MCB3 (1 Pole)		Secondary MCB 24 volt MCB3 (1 Pole)	
		Size	Part Number	Size	Part Number	Size	Part Number
12927	200-240	1.00	21613	.50	21615	2.00	21617
12928	380-415	.50	21612	.50	21615	2.00	21617
12927	440-480	.50	21612	.50	21615	2.00	21617

Charts for machines with fuses.

Motor Full Load Amperage	Overload Relay (OL1) Part Number
.4 - .63	21543
.63 - .99	21446
1.00 - 1.29	21447
1.30 - 1.69	21448
1.70 - 2.19	21449
2.20 - 2.79	21450
2.80 - 3.49	21451
3.50 - 4.49	21452
4.50 - 5.99	21453
6.00 - 7.49	21454
7.50 - 9.99	21455
10.00 - 12.99	21456
13.00 - 17.99	21457
18.00 - 23.99	21458
24.00 - 32.00	21459

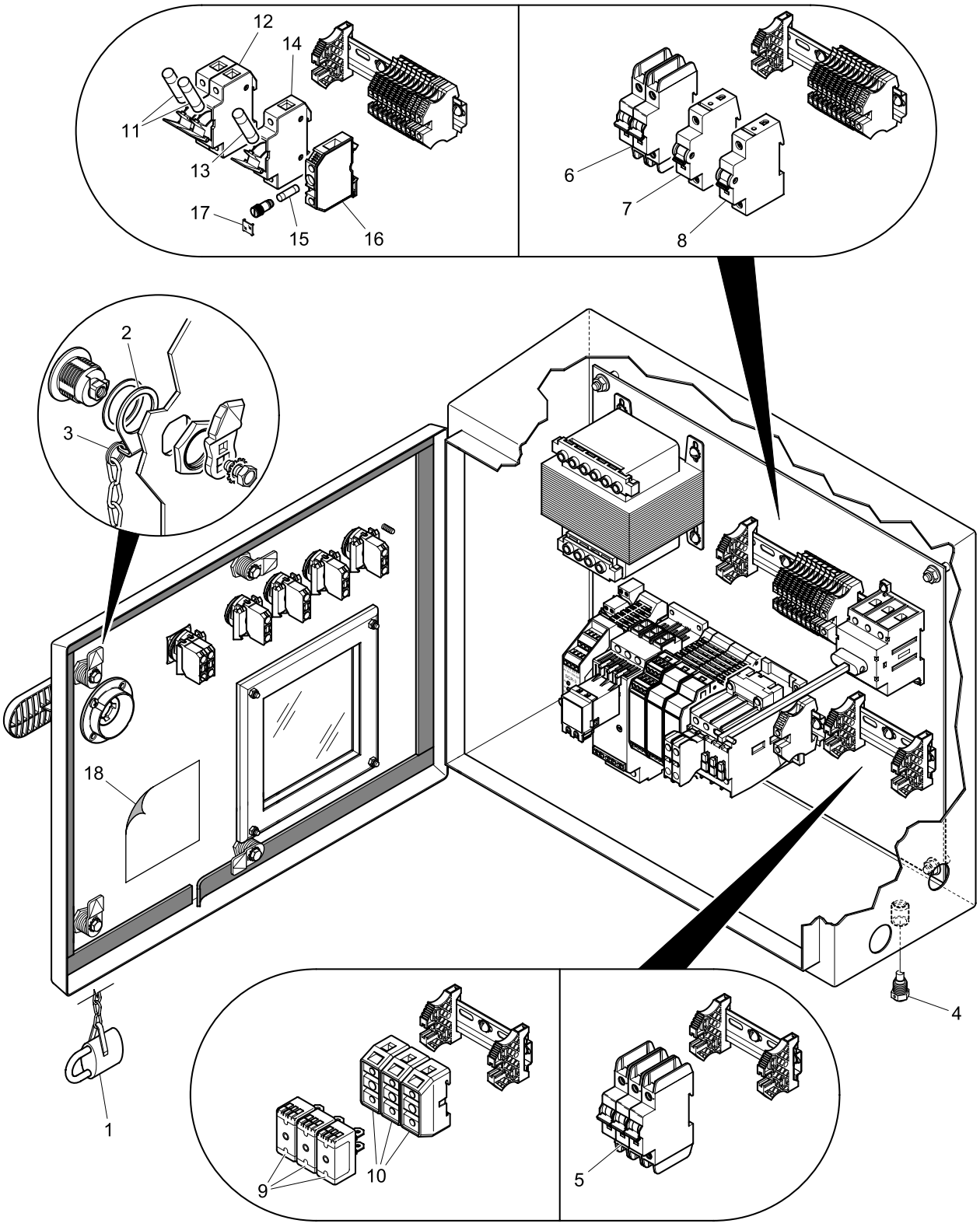
Motor Full Load Amperage	"Cube" Fuse (FU1) Part Number	Fuse Size
0 - 1.71	21384	3
1.72 - 3.42	21341	6
3.43 - 5.71	21339	10
5.72 - 8.57	21325	15
8.58 - 10.00	21326	17.5
10.01 - 11.42	21327	20
11.43 - 14.28	21328	25
14.29 - 17.14	21329	30
17.15 - 20.00	21330	35
20.01 - 22.85	21331	40
22.86 - 25.71	21332	45
25.72 - 28.57	21333	50
28.58 - 32.00	21334	60

Where Used	Transformer Part Number	Primary Voltage	Primary Fuse (FU2)		Secondary Fuse (FU3) 24 volt	
			Size	Part Number	Size	Part Number
N. America	12927	200-240	1.00	12925	2.50	12922
Elsewhere	12927	200-240	1.00	12929	2.50	12922
N. America	12927	440-480	.50	12926	2.50	12922
Elsewhere	12928	380-415	.50	12924	2.50	12922
N. America	21310	575	.40	21509	2.50	12922

Manual Page Number	Revision

98-113 Parts, Electrical Assembly, 10 hp: Repair parts for the previous assembly and enclosure are shown below and on the following pages.

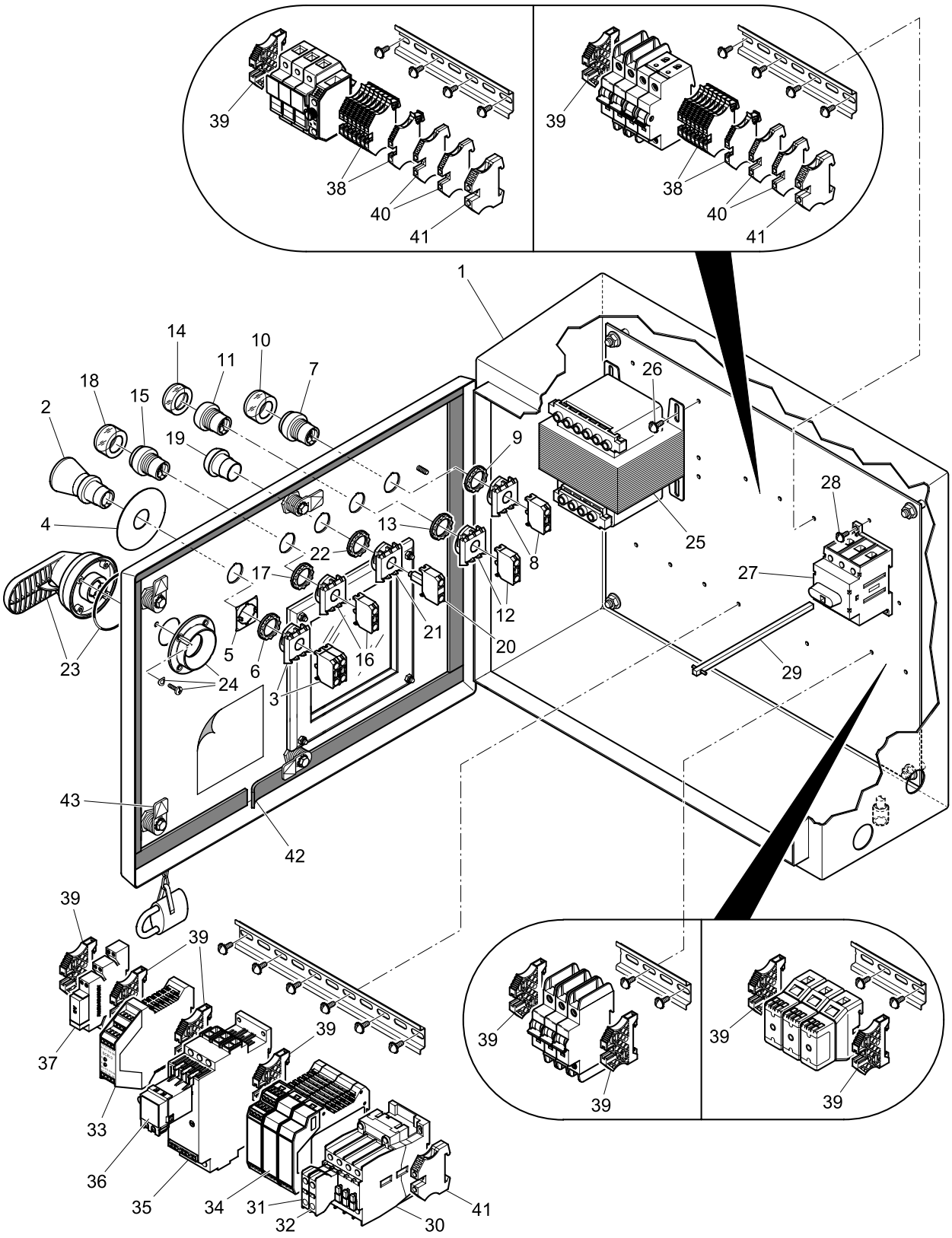
*Current assemblies are supplied with **fuses or mini circuit breakers (MCB)**. See the information in this addendum to determine which device is appropriate for your machine.*



Item	Quantity	Part Number and Description
–	1	**25608*** - Electrical Assembly, CC-D, 10 hp (includes items 1–17)
1	1	**13408** - Padlock With Chain
2	1	**21778** - Padlock Retainer
3	1	**21499** - Split Ring, s.s.
4	1	**11593** - Breather/Drain 1/4"
Short Circuit Protective Device (SCPD), choose circuit breakers (items 5–8) or fuses (items 9–17).		
5	1	** - Circuit Breaker, mini, 3 pole (MCB1, main)
6	1	** - Circuit Breaker, mini, 2 pole (MCB2, primary)
7	1	** - Circuit Breaker, mini, 1 pole (MCB3, secondary)
8	1	** - Circuit Breaker, mini, 1 pole (MCB4, secondary)
9	3	** - Fuse, cube (FU1, main)
10	3	**21324** - Fuse Base, 60 amp, cube (for FU1)
11	2	** - Fuse (FU2, primary)
12	1	**12930** - Modular Fuse Holder, 2 pole (for FU2)
13	1	** - Fuse (FU3, secondary)
14	1	**21253** - Modular Fuse Holder, 1 pole (for FU3)
15	1	** - Fuse, 2.50 amp (FU4, secondary)
16	1	**12763** - Fuse Terminal, 5 x 20mm, IEC (for FU4, includes item 17)
17	1	**12781** - Transparent Cover
18	1	**25609** - Wiring Diagram, CC-D, 10 hp

* Not for sale. Part numbers supplied for reference only.
** See Short Circuit Protective Device (SCPD) Charts on the following pages.
Electrical assemblies also include the Safety Switches and Enclosure Fittings. See the following pages.

Manual Page Number	Revision
98-113	Parts, Electrical Assembly, 10 hp *(continued)*: Repair parts for the previous assembly and enclosure are shown below and on the following pages. The assembly parts list begins on the previous page.



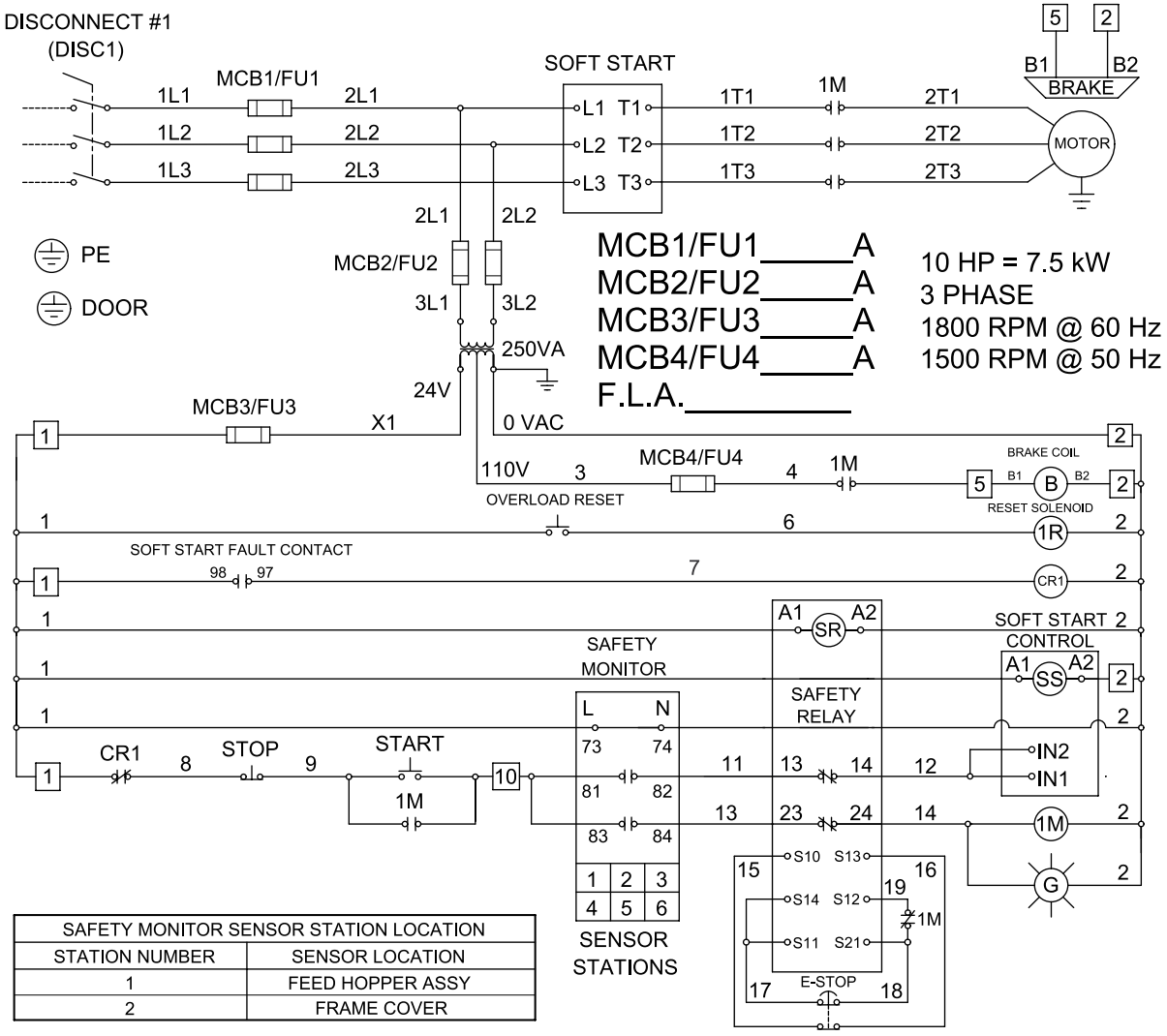
Item	Quantity	Part Number and Description
1	1	**25603*** - Electrical Enclosure, CC, 10 hp (includes items 2–43)
–	1	**21763** - Push Button Assembly, E-Stop, 2 normally closed (includes items 2–6)
2	1	**21427** - Push Button, stop
3	2	**21429** - Contact Block, normally closed, with latch
4	1	**21428** - Legend Plate, yellow, round
5	1	**21578** - Washer, push button, anti-rotation
6	1	**21572** - Push Button Nut, metal
–	1	**21622** - Push Button Assembly, reset (includes items 7–10)
7	1	**21623** - Push Button, reset
8	1	**21430** - Contact Block, normally open, with latch
9	1	**21572** - Push Button Nut, metal
10	1	**21431** - Boot, push button
–	1	**21424** - Push Button Assembly, start (includes items 11–14)
11	1	**21425** - Push Button, start
12	1	**21430** - Contact Block, normally open, with latch
13	1	**21572** - Push Button Nut, metal
14	1	**21431** - Boot, push button
–	1	**21723** - Push Button Assembly, stop, std (includes items 15–18)
15	1	**21487** - Push Button, stop
16	1	**21429** - Contact Block, normally closed, with latch
17	1	**21572** - Push Button Nut, metal
18	1	**21721** - Boot, extended, push button, A-B
–	1	**21648** - Pilot Light Assembly, 24 volt, green (includes items 19–22)
19	1	**21434** - Pilot Light
20	1	**21491** - Pilot Light Lamp Module, 24 volt
21	1	**21432** - Latch, push button
22	1	**21572** - Push Button Nut, metal
23	1	**21560** - Disconnect Switch Handle (includes O-ring)
24	1	**21460** - Disconnect Rod Guide
25	1	**21747** - Control Circuit Transformer, 250 VA
26	4	**10625** - Round Head Machine Screw, with washer, 10-32 x 1/2"
27	1	**21557** - Disconnect Switch, 3 pole, non-fusible, 40 amp (DISC 1)
28	2	**10415** - Round Head Machine Screw, with washer, 8-32 x 1/2"
29	1	**21559** - Disconnect Shaft, extended, 10.4" long
30	1	**21629** - Contactor, 60 amp, 24 volt coil (1M)
31	1	**21468** - Auxiliary Contact, ABB, normally open (for 1M)
32	1	**21469** - Auxiliary Contact, ABB, normally closed (for 1M)
33	1	**21634** - Safety Relay
34	1	**21724** - Safety Amplifier, 24 VAC
35	1	**21596** - Soft Start Controller, 37 amp
36	1	**21601** - Soft Start Overload Reset Solenoid
37	1	**21666** - Control Relay, 1/2" wide, 24 volt (CR1)
38	8	**21438** - Terminal Block
39	7	**21439** - End Anchor
40	2	**21442** - Grounding Block, size 4
41	2	**21443** - Grounding Block, size 10
42	1	** - Door Gasket (fitting and adhesive required)
43	4	**21270** - Quarter Turn Latch (Industrial Enclosures)
	4	**21271** - Quarter Turn Latch (Hoffman Enclosures)

* Not for sale. Part numbers supplied for reference only.
** Consult the company.

Manual Page Number	Revision

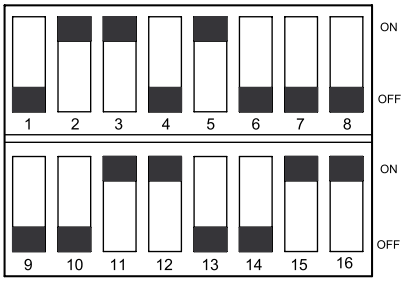
98-113 Parts, Wiring Diagram 25609: Use with the electrical assemblies and enclosure shown on the previous pages.

WIRING DIAGRAM PART # 25609



SAFETY MONITOR SENSOR STATION LOCATION	
STATION NUMBER	SENSOR LOCATION
1	FEED HOPPER ASSY
2	FRAME COVER

SOFT START DIP
SWITCH CHART



Charts for machines with mini circuit breakers.

3 POLE MINI CIRCUIT BREAKER CHART (MCB1)		
Motor Full Load Amperage	"MCB" Part Number	Fuse Size (Amps)
0 - 1.71	21602	3
1.72 - 2.85	21603	5
2.86 - 3.42	21604	6
3.43 - 4.57	21605	8
4.58 - 5.71	21606	10
5.72 - 7.43	21632	13
7.44 - 8.57	21607	15
8.58 - 11.42	21608	20
11.43 - 14.28	21609	25
14.29 - 17.14	21610	30
17.15 - 20.00	21611	40

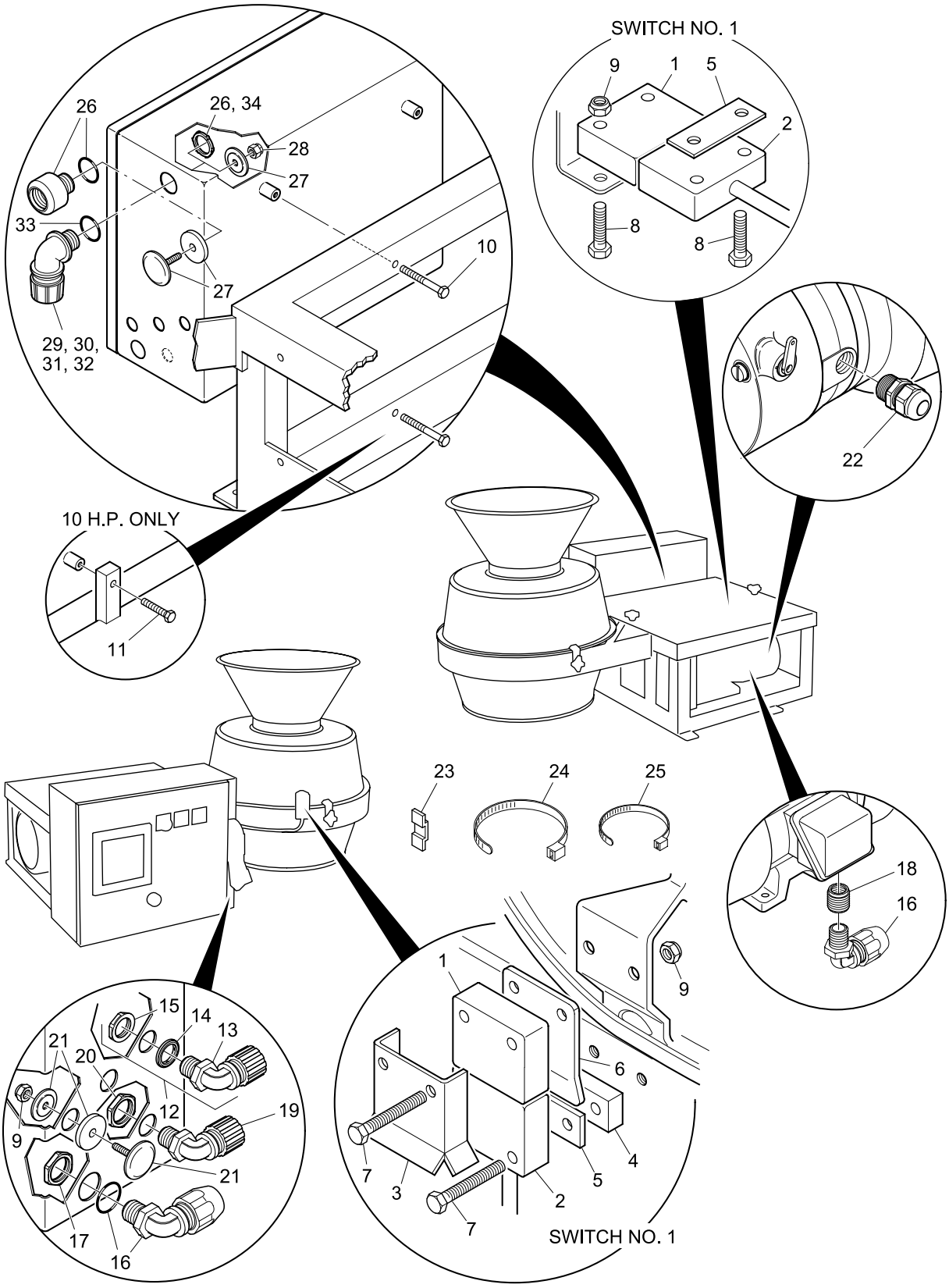
CONTROL CIRCUIT TRANSFORMER CHART USING MINI CIRCUIT BREAKERS							
Transformer Part Number	Primary Voltage	Primary MCB MCB2 (2 Pole)		Secondary MCB 24 volt MCB3 (1 Pole)		Secondary MCB 110 volt MCB4 (1 Pole)	
		Size	Part Number	Size	Part Number	Size	Part Number
21747	200-240	4.0	21635	12.0	21785	3.0	21618
21747	380-415	3.0	21628	12.0	21785	3.0	21618
21747	440-480	2.0	21614	12.0	21785	3.0	21618

Charts for machines with fuses.

Motor Full Load Amperage	"Cube" Fuse (FU1) Part Number	Fuse Size
0 - 1.71	21384	3
1.72 - 3.42	21341	6
3.43 - 5.71	21339	10
5.72 - 8.57	21325	15
8.58 - 10.00	21326	17.5
10.01 - 11.42	21327	20
11.43 - 14.28	21328	25
14.29 - 17.14	21329	30
17.15 - 20.00	21330	35
20.01 - 22.85	21331	40
22.86 - 25.71	21332	45
25.72 - 28.57	21333	50
28.58 - 32.00	21334	60

Where Used	Transformer Part Number	Primary Voltage	Primary Fuse (FU2)		Secondary Fuse (FU3) 24 volt		Secondary Fuse (FU4) 110-120 volt	
			Size	Part Number	Size	Part Number	Size	Part Number
N. America	21747	200-240	4.0	12948	12.0	21762	2.5	12922
Elsewhere	21747	200-240	4.0	12948	12.0	21762	2.5	12922
Elsewhere	21747	380-415	3.0	21347	12.0	21762	2.5	12922
N. America	21747	440-480	2.0	12699	12.0	21762	2.5	12922
Canada	21747	575	2.0	12699	12.0	21762	2.5	12922

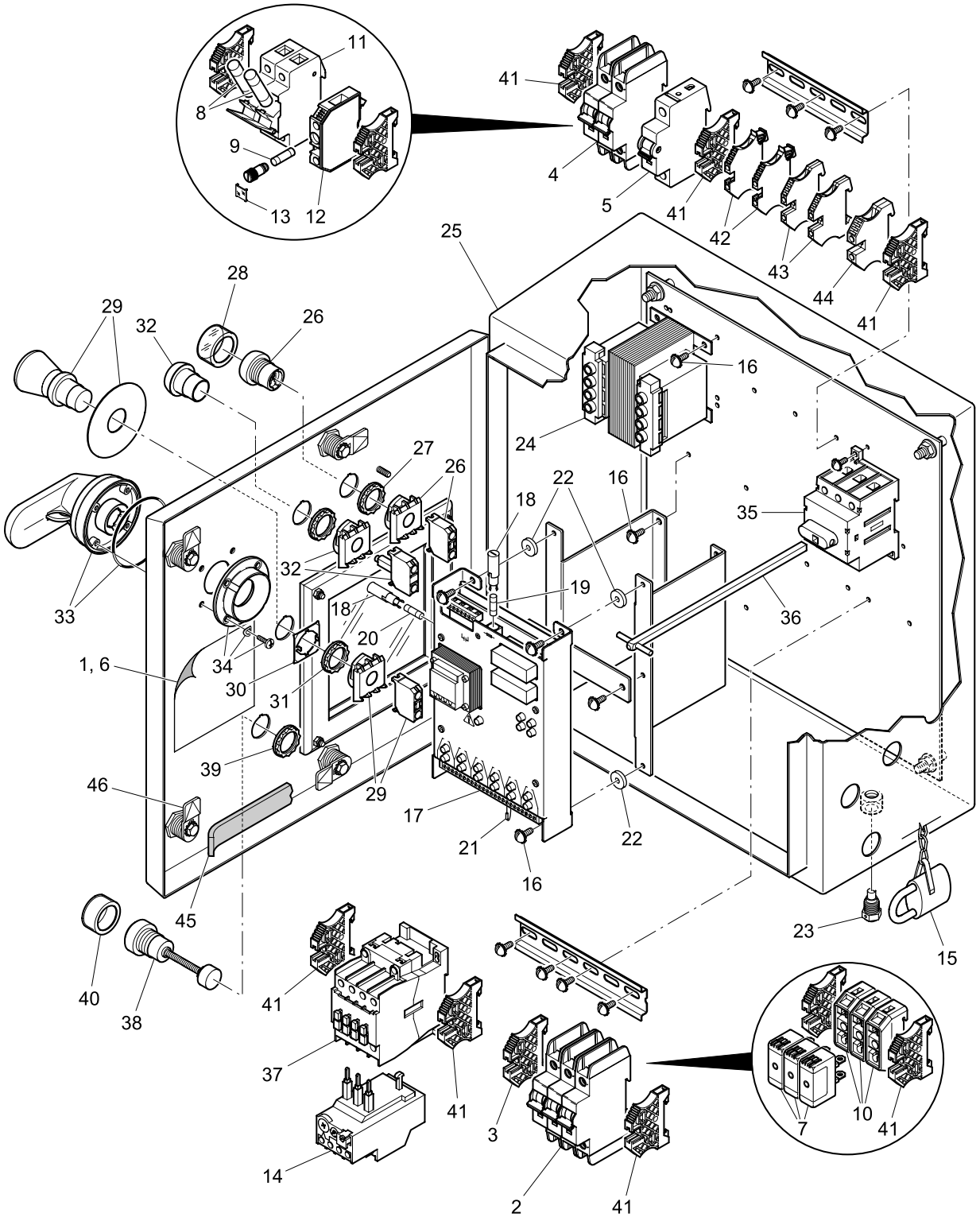
Manual Page Number	Revision
98-113	Parts, Electrical Assembly, Switches: Repair parts for the previous assembly are shown below and on the following page.



Item	Quantity	Part Number and Description
Electrical assemblies include the following parts:		
1	2	**63741** - Actuator
2	2	**63738** - Sensor, 6' lead
3	1	**63133** - Alignment Bracket
4	1	**12807** - Spacer, 1/2" (12.7 mm)
5	1	**12801** - Spacer, 1/8" (3.2 mm)
6	1	**22935** - Spacer, actuator bracket, CC-D
7	4	**10233** - Hex Head Cap Screw, 10-24 x 1", s.s.
8	4	**10351** - Hex Head Cap Screw, 10-24 x 7/8", s.s.
9	7	**10231** - Hex Nut, 10-24, s.s., locking
10	4	**10053** - Hex Head Cap Screw, 5/16-18 x 2-1/2", s.s.
11	2	**10048** - Hex Head Cap Screw, 5/16-18 x 1-1/4", s.s. (10 hp motor only)
12	2	**11548** - Cord Connector, 90 degree, .250/.375 (includes items 13–15)
13	1	**11609** - Cord Connector, 90 degree, .250/.375
14	1	**11900** - Seal Washer, 3/16" x 7/8" x 1-9/32"
15	1	**11611** - Lock Nut, 1/2"
16	2	**11614** - Conduit Connector, 90 degree, 1/2"
	2	**11616** - Conduit Connector, 90 degree, 3/4" (10 hp motor only)
17	1	**11611** - Lock Nut, 1/2"
	1	**11970** - Lock Nut, 3/4", NPT (10 hp motor only)
18	1	**11502** - Reducing Bushing, 1/2" x 3/4" (5 hp motor only)
	1	**11505** - Reducing Bushing, 3/4 x 1" (10 hp motor only)
19	1	**21661** - Cord Connector, 90 degree, 3/4", .375/.500" (10 hp motor only)
20	1	**11970** - Lock Nut, 3/4", NPT (10 hp motor only)
21	1	**11553** - Hole Seal, 7/8"
22	1	**11877** - Cord Connector, straight, .236/.472 (10 hp motor only)
23	8	**13465** - Cable Tie Clip
24	8	**11513** - Cable Tie
25	10	**11534** - Cable Tie, small, 99 mm long
Items below are not included with the electrical assembly; use at the power source entry point.		
26	1	**11582** - Conduit Hub, 1" (includes washer and lock nut)
27	1	**11591** - Hole Seal, 1-3/8"
28	1	**10231** - Hex Nut, 10-24, s.s., locking
–	1	**11626** - Cord Connector Assembly, 90 degree, .437"/.562" (includes items 29, 33, 34)
29	1	**11625** - Cord Connector, 90 degree, .437"/.562"
–	1	**21370** - Cord Connector Assembly, 90 degree, .62"/.75" (includes items 30, 33, 34)
30	1	**21368** - Cord Connector, 90 degree, .62"/.75"
–	1	**21371** - Cord Connector Assembly, 90 degree, .75"/.88" (includes items 31, 33, 34)
31	1	**21369** - Cord Connector, 90 degree, .75"/.88"
–	1	**21372** - Cord Connector Assembly, 90 degree, .88"/1.00" (includes items 32, 33, 34)
32	1	**11972** - Cord Connector, 90 degree, .88"/1.00"
33	1	**11966** - Seal Washer, 3/16" x 1-5/16" x 1-3/4"
34	1	**11624** - Lock Nut

98-113 Parts, Electrical Assembly *(continued)*: Repair parts for previous assemblies.

This electrical assembly was used prior to the assembly currently supplied on new machines. Repair parts are available except as noted. See previous pages for the assembly currently supplied on machines.



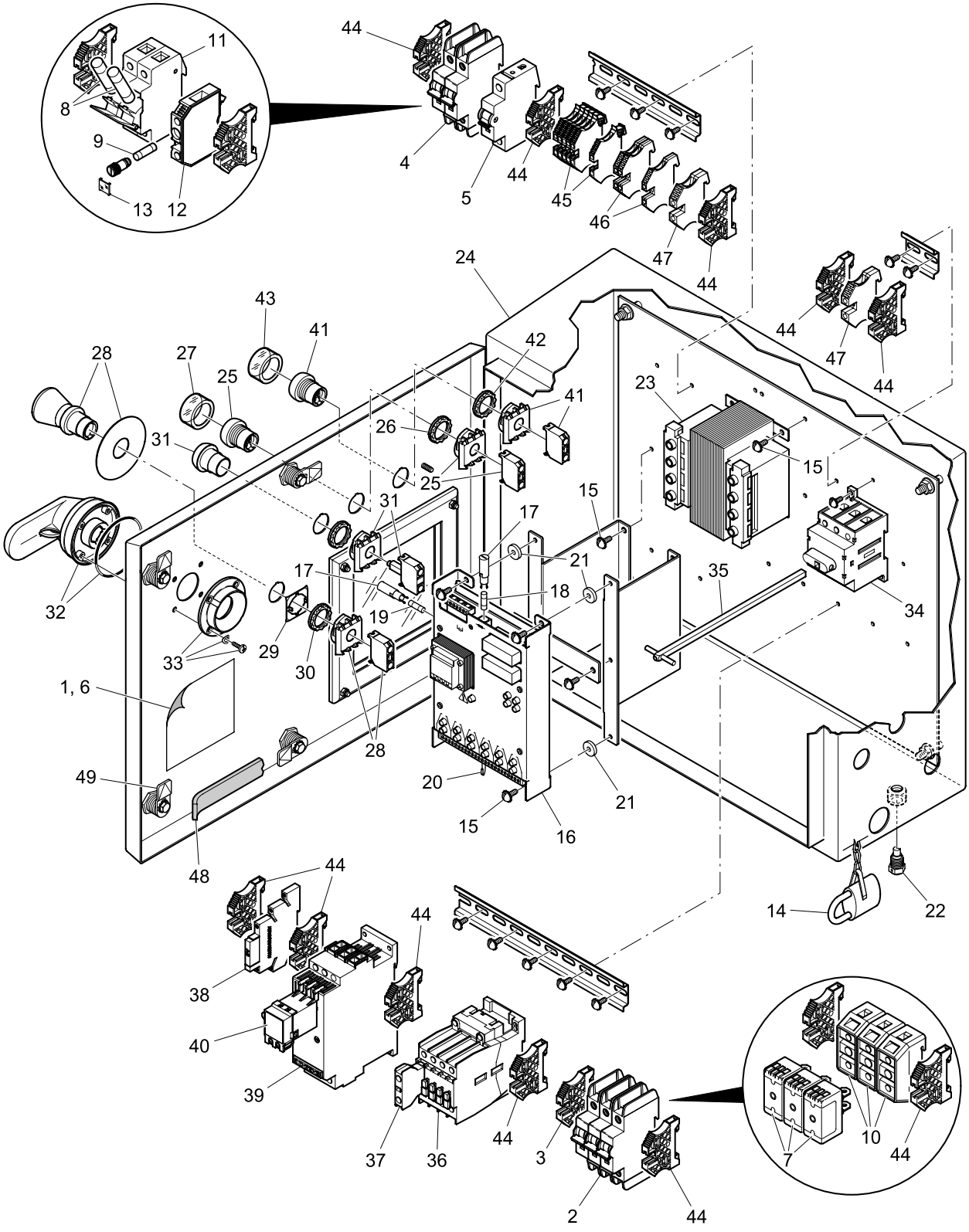
Item	Quantity	Part Number and Description
–	1	**23844*** - Electrical Assembly, CC-D, 5 hp, mini circuit breakers (includes items 1-5 and 14-24)
1	1	**23845** - Wiring Diagram, CC-D, 5 hp, mini circuit breakers
2	1	** - Circuit Breakers, mini, 3 pole, main (MCB 1)
3	1	**21439** - End Anchor
4	1	** Circuit Breaker, mini, 2 pole, primary, (MCB2)
5	1	**21615** - Circuit Breaker, mini, 1 pole, secondary, .50 amp, (MCB3)
–	1	**23846*** - Electrical Assembly, CC-D, 5 hp, fuses (includes items 6-24)
6	1	**23847** - Wiring Diagram, CC-D, 5 hp, fuses
7	3	** - Fuse, main (FU1)
8	2	** - Fuse, primary (FU2)
9	1	**12923** - Fuse, secondary, .50 amp (FU3)
10	3	**21349** - Fuse Base, 30 amp, cube (for FU1)
11	1	**12930** - Modular Fuse Holder, 2 pole (for FU2)
12	1	**12763** - Fuse Terminal, 5 x 20 mm, IEC (for FU3, includes item 13)
13	1	**12871** - Transparent Cover for Adjustment Dial
14	1	** - Overload Relay (OL1)
15	1	**13408** - Padlock with Chain
16	12	**10625** - Round Head Machine Screw with Washer, 10-32 x 1/2"
17	1	**63737** - Amplifier (includes items 18-21)
18	2	**13673** - Fuse Adapter
19	1	**13671** - Fuse, .630 amp
20	1	**13672** - Fuse, .125 amp
21	8	**63755** - Resistor, 22K ohms
22	4	**12633** - Rubber Washer, 3/16" x 5/8" x 1/8" thick
23	1	**11593** - Breather/Drain, 1/4"
24		** - Control Circuit Transformer
25	1	**23817*** - Electrical Enclosure, 2/85 hp, CC (includes items 26-46)
26	1	**21424** - Push Button Assembly, start (includes items 27-28)
27	1	**21572** - Push Button Nut, metal
28	1	**21431** - Boot, push button
29	1	**21426** - Push Button Assembly, stop (includes items 30-31)
30	1	**21578** - Washer, push button, anti-rotation
31	1	**21572** - Push Button Nut, metal
32	1	**21433** - Pilot Light Assembly
33	1	**21560** - Disconnect Switch Handle, s.s. (includes o-ring)
34	1	**21460** - Disconnect Rod Guide
35	1	**21557** - Disconnect Switch, 3 pole, 40 amp (DISC1)
36	1	**21559** - Disconnect Shaft, extended, 10.4" long
37	1	**21444** - Contactor, 40 amp (1M)
38	1	**21436** - Reset Button Assembly (includes items 39-40)
39	1	**21572** - Push Button Nut, metal
40	1	**21431** - Boot, push button
41	6	**21439** - End Anchor
42	2	**21438** - Terminal Block
43	2	**21442** - Grounding Block, size 4
44	1	**21443** - Grounding Block, size 10
45	1	*** - Door Gasket (fitting and adhesive required)
46	4	**21270** - Quarter Turn Latch Assembly, Industrial enclosures
–	4	**21271** - Quarter Turn Latch Assembly, Hoffman enclosures

* Not for sale. Part numbers supplied for reference only.
** See the charts on the following pages.
*** Consult the factory.
Electrical assemblies also include safety switches and related parts.

Manual Page Number	Revision

98-113 Parts, Electrical Assembly *(continued)*: Repair parts for previous assemblies.

This electrical assembly was used prior to the assembly currently supplied on new machines. Repair parts are available except as noted. See previous pages for the assembly currently supplied on machines.



Item	Quantity	Part Number and Description
–	1	**23848*** - Electrical Assembly, CC-D, 10 hp, mini circuit breakers (includes items 1-5 and 14-23)
1	1	**23849** - Wiring Diagram, CC-D, 10 hp, mini circuit breakers
2	1	** - Circuit Breaker, mini, 3 pole, main (MCB1)
3	1	**21439** - End Anchor
4	1	** - Circuit Breaker, mini, 2 pole, primary (MCB2)
5	1	**21624** - Circuit Breaker, mini, 1 pole, secondary, 1.50 amp (MCB3)
–	1	**23850*** - Electrical Assembly, CC-D, 10 hp, fuses (includes items 6-23)
6	1	**23851** - Wiring Diagram, CC-D 10 hp, fuses
7	3	** - Fuse, main (FU1)
8	2	** - Fuse, primary (FU2)
9	1	**12993** - Fuse, secondary, .50 amp (FU3)
10	3	**21324** - Fuse Base, 60 amp, cube (for FU1)
11	1	**12930** - Modular Fuse Holder, 2 pole (for FU2)
12	1	**12763** - Fuse Terminal, 5 x 20 mm, IEC (for FU3, includes item 13)
13	1	**12871** - Transparent Cover for Adjustment Dial
14	1	**13408** - Padlock with Chain
15	12	**10625** - Round Head Machine Screw with Washer, 10-32 x 1/2"
16	1	**63737** - Amplifier (includes items 17-20)
17	2	**13673** - Fuse Adapter
18	1	**13671** - Fuse, .630 amp
19	1	**13672** - Fuse, .125 amp
20	8	**63755** - Resistor, 22K ohms
21	4	**12633** - Rubber Washer, 3/16" x 5/8" x 1/8" thick
22	1	**11593** - Breather Drain, 1/4"
23	1	** - Control Circuit Transformer
24	1	**23831*** - Electrical Enclosure, 10 hp, CC, CC-D (includes items 25-49)
25	1	**21424** - Push Button Assembly, start (includes items 26-27)
26	1	**21572** - Push Button Nut, metal
27	1	**21431** - Boot, push button
28	1	**21426** - Push Button Assembly, stop (includes items 29-30)
29	1	**21578** - Washer, push button, anti-rotation
30	1	**21572** - Push Button Nut, metal
31	1	**21433** - Pilot Light Assembly
32	1	**21560** - Disconnect Switch Handle, s.s. (includes o-ring)
33	1	**21460** - Disconnect Rod Guide
34	1	**21557** - Disconnect Switch, 3 pole, 40 amp (DISC1)
35	1	**21559** - Disconnect Shaft, extended, 10.4" long
36	1	**21445** - Contactor, 60 amp (1M)
37	1	**21468** - Auxiliary Contact, ABB, normally open (for 1M)
38	1	**21638** - Control Relay, thin
39	1	**21621** - Soft Start, 37 amp, 110 volt
40	1	**21620** - Soft Start Overload Relay Reset, 110 volt
41	1	**21622** - Push Button Assembly, reset (includes items 42-43)
42	1	**21572** - Push Button Nut, metal
43	1	**21431** - Boot, push button
44	10	**21439** - End Anchor
45	6	**21438** - Terminal Block
46	3	**21442** - Grounding Block, size 4
47	2	**21443** - Grounding Block, size 10
48	1	*** - Door Gasket (fitting and adhesive required)
49	4	**21270** - Quarter Turn Latch Assembly, Industrial enclosures
–	4	**12171** - Quarter Turn Latch Assembly, Hoffman enclosures

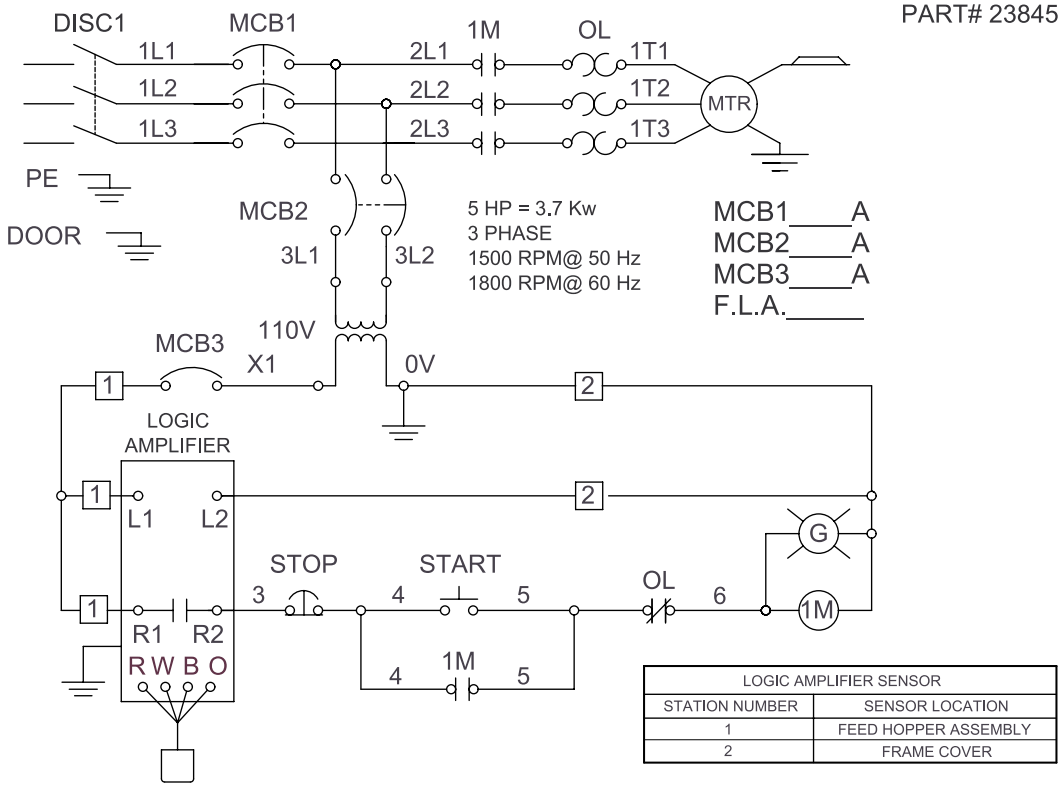
* Not for sale. Part numbers supplied for reference only.
** See the charts on the following pages.
*** Consult the factory.
Electrical assemblies also include safety switches and related parts.

Manual Page Number	Revision

98-113 Parts, Electrical Assembly *(continued)*: Repair parts for previous assemblies, wiring diagram 23845, mini circuit breakers. Use with electrical assembly 23844.

This electrical schematic was used prior to the schematic currently supplied on new machines. See previous pages for the schematics currently supplied on machines.

PART# 23845



LOGIC AMPLIFIER SENSOR	
STATION NUMBER	SENSOR LOCATION
1	FEED HOPPER ASSEMBLY
2	FRAME COVER

Motor Full Load Amperage	Overload Relay Part Number
.4 - .63	21543
.63 - .99	21446
1.00 - 1.29	21447
1.30 - 1.69	21448
1.70 - 2.19	21449
2.20 - 2.79	21450
2.80 - 3.49	21451
3.50 - 4.49	21452
4.50 - 5.99	21453
6.00 - 7.49	21454
7.50 - 9.99	21455
10.00 - 12.99	21456
13.00 - 17.99	21457
18.00 - 23.99	21458
24.00 - 32.00	21459

3 POLE MINI CIRCUIT BREAKER CHART (MCB1)		
Motor Full Load Amperage	"MCB" Part Number	Fuse Size (Amps)
0 - 1.71	21602	3
1.72 - 2.85	21603	5
2.86 - 3.42	21604	6
3.43 - 4.57	21605	8
4.58 - 5.71	21606	10
5.72 - 7.43	21632	13
7.44 - 8.57	21607	15
8.58 - 11.42	21608	20
11.43 - 14.28	21609	25
14.29 - 17.14	21610	30
17.15 - 20.00	21611	40

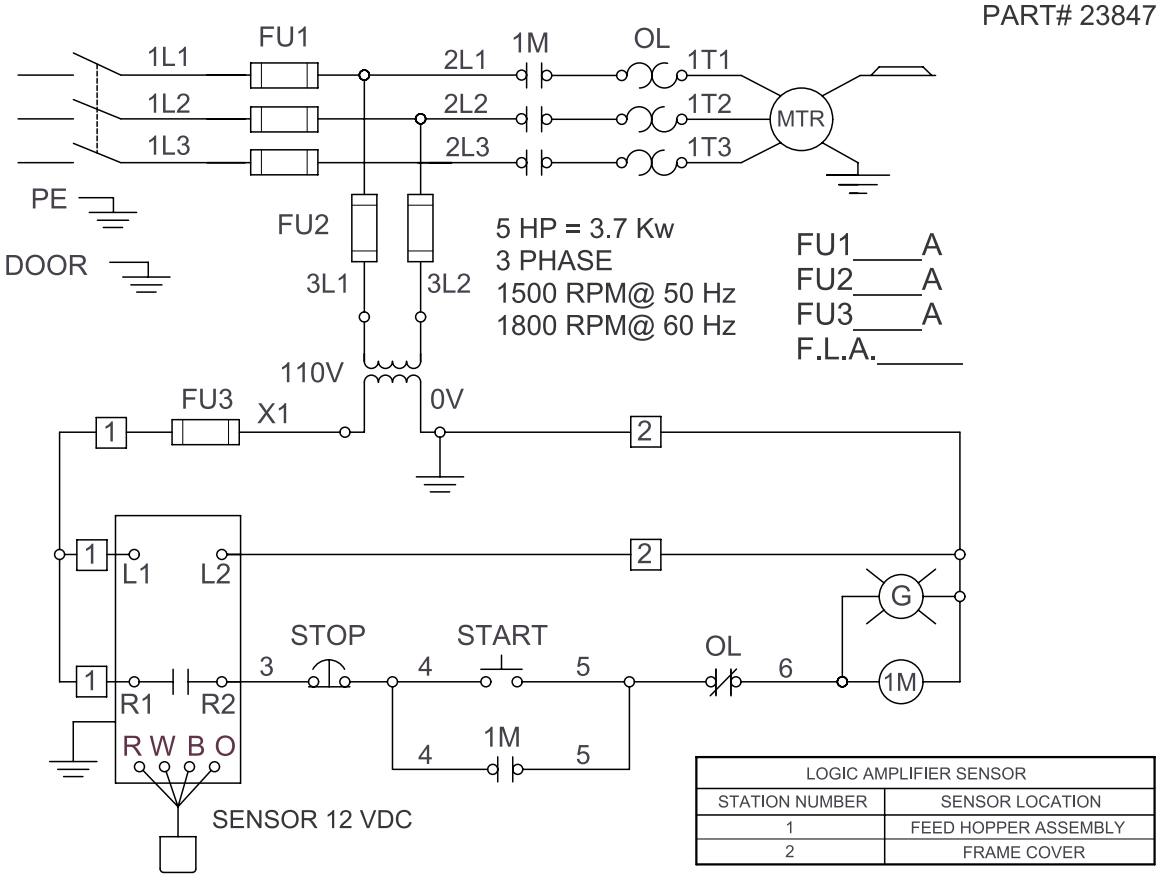
CONTROL CIRCUIT TRANSFORMER CHART USING MINI CIRCUIT BREAKERS							
Transformer Part Number	Primary Voltage	Primary MCB MCB2 (2 Pole)		Secondary MCB 110 volt MCB3 (1 Pole)		Secondary MCB 24 volt MCB3 (1 Pole)	
		Size	Part Number	Size	Part Number	Size	Part Number
12927	200-240	1.00	21613	.50	21615	2.00	21617
12928	380-415	.50	21612	.50	21615	2.00	21617
12927	440-480	.50	21612	.50	21615	2.00	21617
21310	575	.50	21612	.50	21615	2.00	21617

Manual Page Number	Revision

98-113 Parts, Electrical Assembly *(continued)*: Repair parts for previous assemblies, wiring diagram 23847, fuses. Use with electrical assembly 23846.

This electrical schematic was used prior to the schematic currently supplied on new machines. See previous pages for the schematics currently supplied on machines.

PART# 23847



LOGIC AMPLIFIER SENSOR	
STATION NUMBER	SENSOR LOCATION
1	FEED HOPPER ASSEMBLY
2	FRAME COVER

Motor Full Load Amperage	Overload Relay Part Number
.4 - .63	21543
.63 - .99	21446
1.00 - 1.29	21447
1.30 - 1.69	21448
1.70 - 2.19	21449
2.20 - 2.79	21450
2.80 - 3.49	21451
3.50 - 4.49	21452
4.50 - 5.99	21453
6.00 - 7.49	21454
7.50 - 9.99	21455
10.00 - 12.99	21456
13.00 - 17.99	21457
18.00 - 23.99	21458
24.00 - 32.00	21459

Motor Full Load Amperage	"Cube" Fuse Part Number	Fuse Size
0 - 1.71	21384	3
1.72 - 3.42	21341	6
3.43 - 5.71	21339	10
5.72 - 8.57	21325	15
8.58 - 10.00	21326	17.5
10.01 - 11.42	21327	20
11.43 - 14.28	21328	25
14.29 - 17.14	21329	30
17.15 - 20.00	21330	35
20.01 - 22.85	21331	40
22.86 - 25.71	21332	45
25.72 - 28.57	21333	50
28.58 - 32.00	21334	60

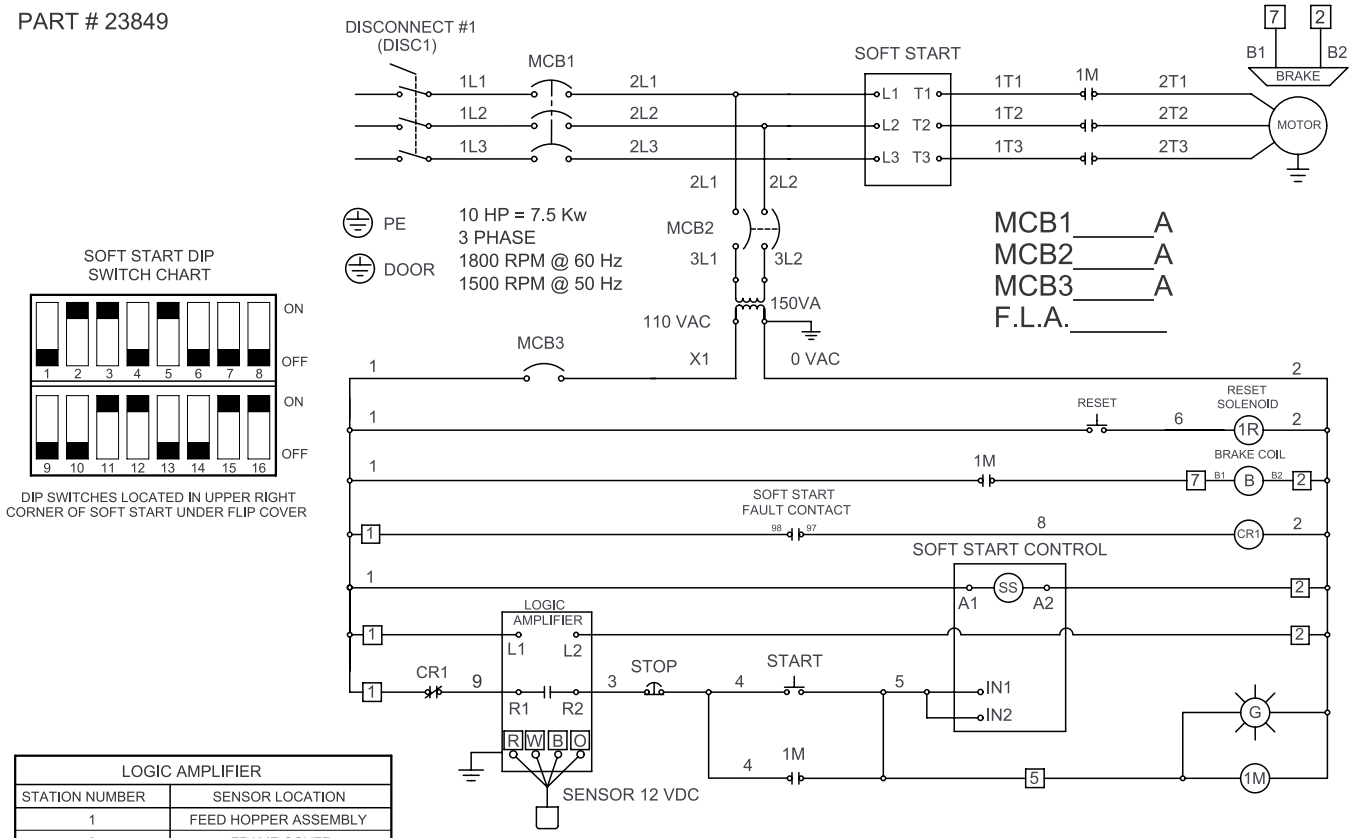
Where Used	Transformer Part Number	Primary Voltage	Primary Fuse		Secondary Fuse 110-120 volt		Secondary Fuse 24 volt	
			Size	Part Number	Size	Part Number	Size	Part Number
N. America	12927	200-240	1.00	12925	.50	12923	2.50	12922
Elsewhere	12927	200-240	1.00	12929	.50	12923	2.50	12922
N. America	12927	440-480	.50	12926	.50	12923	2.50	12922
Elsewhere	12928	380-415	.50	12924	.50	12923	2.50	12922
N. America	21310	575	.40	21509	.50	12923	2.50	12922

Manual Page Number	Revision

98-113 Parts, Electrical Assembly *(continued)*: Repair parts for previous assemblies, wiring diagram 23849, mini circuit breakers. Use with electrical assembly 23848.

This electrical schematic was used prior to the schematic currently supplied on new machines. See previous pages for the schematics currently supplied on machines.

PART # 23849



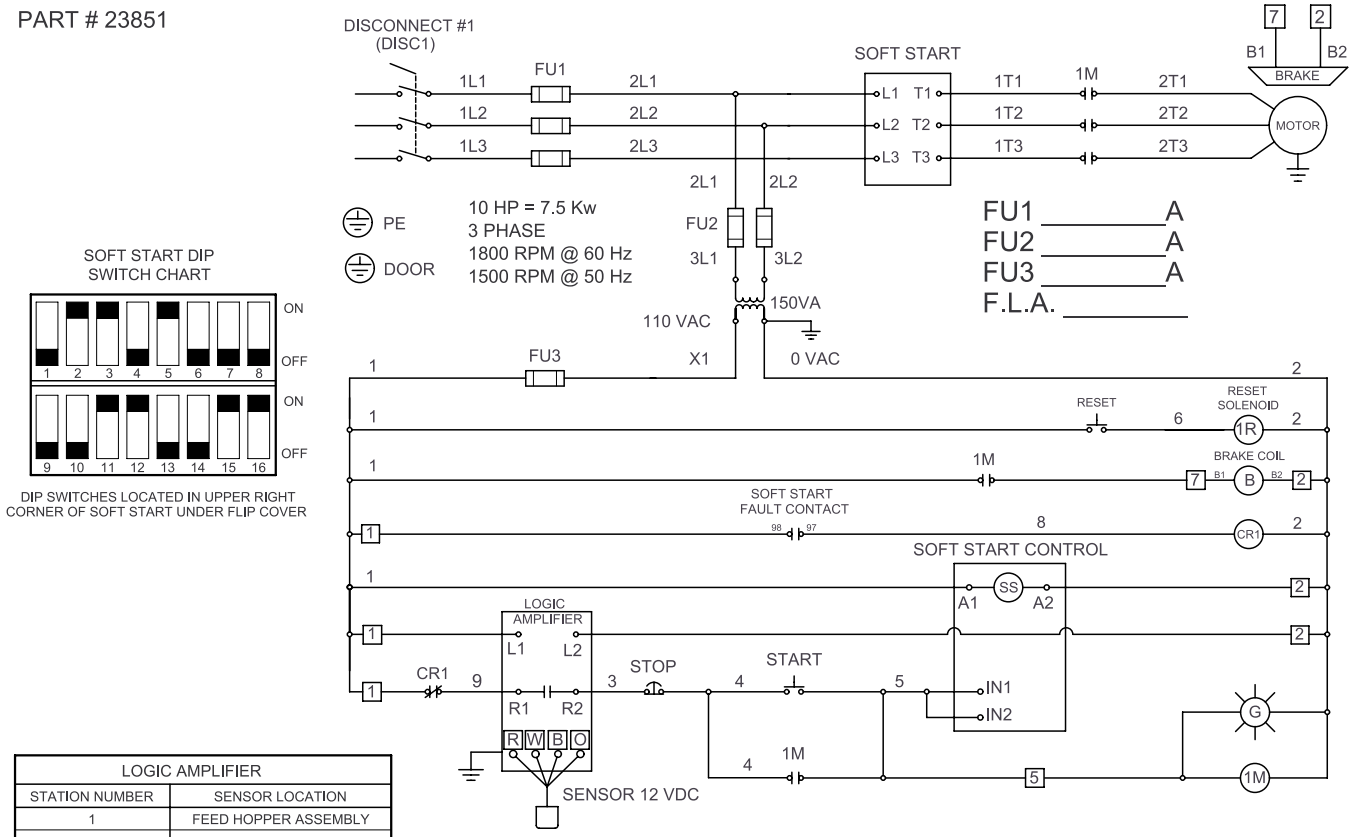
LOGIC AMPLIFIER	
STATION NUMBER	SENSOR LOCATION
1	FEED HOPPER ASSEMBLY
2	FRAME COVER

3 POLE MINI CIRCUIT BREAKER CHART (MCB1)		
Motor Full Load Amperage	**"MCB" Part Number**	**Fuse Size (Amps)**
0 - 1.71	21602	3
1.72 - 2.85	21603	5
2.86 - 3.42	21604	6
3.43 - 4.57	21605	8
4.58 - 5.71	21606	10
5.72 - 7.43	21632	13
7.44 - 8.57	21607	15
8.58 - 11.42	21608	20
11.43 - 14.28	21609	25
14.29 - 17.14	21610	30
17.15 - 20.00	21611	40

CONTROL CIRCUIT TRANSFORMER CHART USING MINI CIRCUIT BREAKERS							
Transformer Part Number	**Primary Voltage**	**Primary MCB MCB2 (2 Pole)**		**Secondary MCB 110 volt MCB3 (1 Pole)**		**Secondary MCB 24 volt MCB3 (1 Pole)**	
		Size	**Part Number**	**Size**	**Part Number**	**Size**	**Part Number**
51475	200-240	2.00	21614	1.50	21624	8.00	21625
51476	380-415	2.00	21614	1.50	21624	8.00	21625
51475	440-480	1.00	21613	1.50	21624	8.00	21625
51477	575	1.00	21613	1.50	21624	8.00	21625

Manual Page Number	Revision
98-113	Parts, Electrical Assembly *(continued)*: Repair parts for previous assemblies, wiring diagram 23851, fuses. Use with electrical assembly 23850.

PART # 23851



LOGIC AMPLIFIER	
STATION NUMBER	SENSOR LOCATION
1	FEED HOPPER ASSEMBLY
2	FRAME COVER

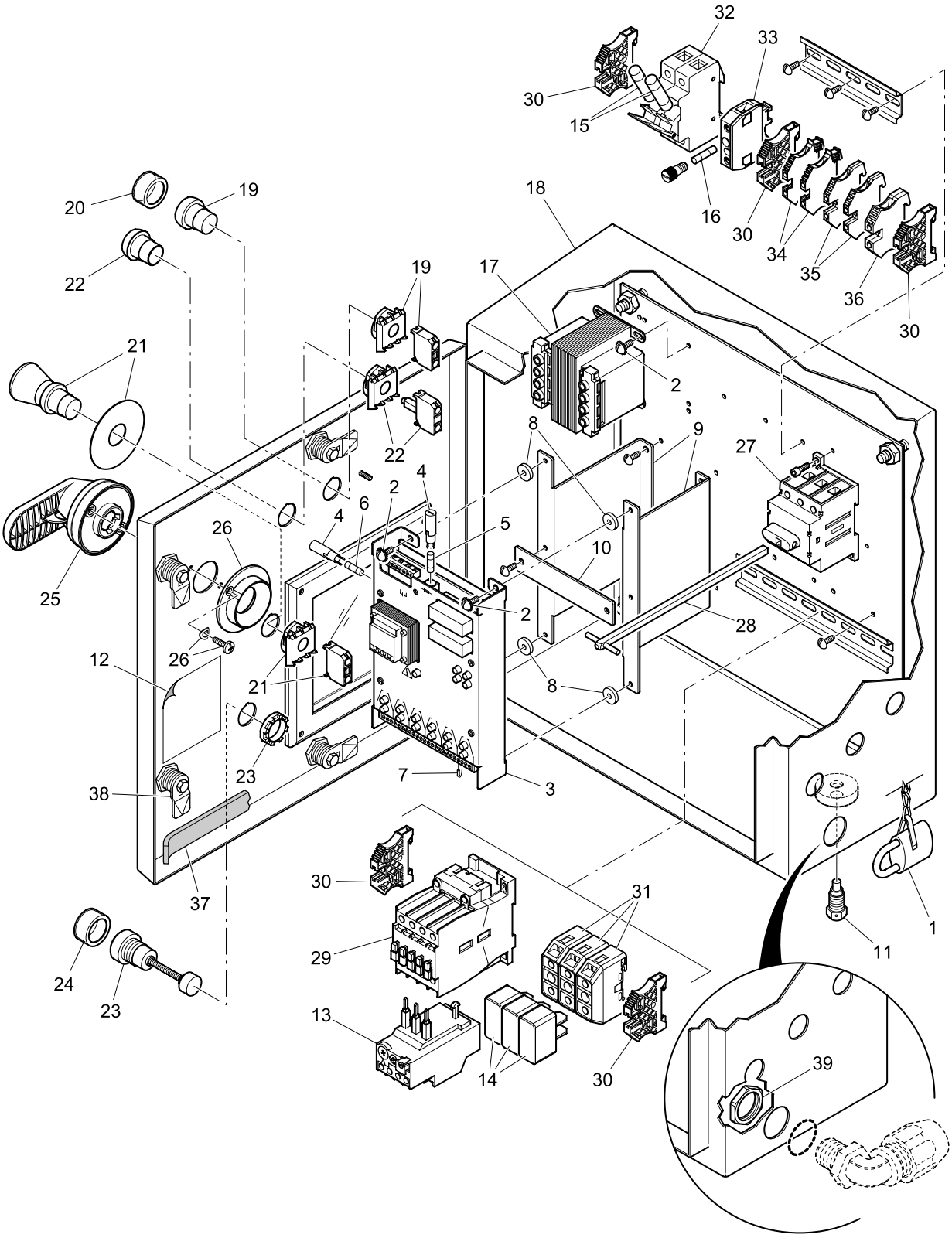
Motor Full Load Amperage	"Cube" Fuse Part Number	Fuse Size
0 - 1.71	21384	3
1.72 - 3.42	21341	6
3.43 - 5.71	21339	10
5.72 - 8.57	21325	15
8.58 - 10.00	21326	17.5
10.01 - 11.42	21327	20
11.43 - 14.28	21328	25
14.29 - 17.14	21329	30
17.15 - 20.00	21330	35
20.01 - 22.85	21331	40
22.86 - 25.71	21332	45
25.72 - 28.57	21333	50
28.58 - 32.00	21334	60

Transformer Part Number	V.A.	Primary Voltage	Secondary Voltage	Hertz	Secondary Fuse Size	Secondary Fuse Number	Primary Fuse Size	Primary Fuse Number
51475	150	200-240	110	50	1-6/10	12993	4	12948
51475	150	208-230	115	60	1-6/10	12993	3	21307
51476	150	380-400	110	50	1-6/10	12993	2	12994
51476	150	415	110	50	1-6/10	12993	1	12929
51475	150	440-480	115	60	1-6/10	12993	1	12925
51477	150	575	115	60	1-6/10	12993	1	12693

Manual Page Number	Revision

98-113 Parts, Electrical Assembly *(continued)*: Repair parts for previous assemblies.

This electrical assembly was used prior to the assembly currently supplied on new machines. Repair parts are available except as noted. See previous pages for the assembly currently supplied on machines.



Item	Quantity	Part Number and Description
–	1	**23671*** Electrical Assembly, CC-D (includes items 1-17)
1	1	**13408** - Padlock with Chain
2	8	**10625** - Round Head Machine Screw with Washer, 10-32 x 1/2"
3	1	**63737** - Amplifier (includes items 4-7)
4	2	**13673** - Adapter, fuse
5	1	**13671** - Fuse, .630 amp
6	1	**13672** - Fuse, .125 amp
7	8	**63755** - Resistor, 22K ohms
8	4	**12633** - Rubber Washer, 3/16" x 5/8" x 1/8" thick
9	2	** - Amplifier Bracket
10	1	** - Amplifier Bracket Brace
11	1	**11593** - Breather Drain, 1/4"
12	1	**23670** - Wiring Diagram, CC-D
13	1	*** - Overload Relay (OL1)
14	3	*** - Fuse, main (FU1)
15	2	** - Fuse, primary (FU2)
16	1	**12923** - Fuse, secondary, .50 amp (FU3)
17	1	*** - Control Circuit Transformer
18	1	**23666*** - Electrical Enclosure (includes items 19-39)
19	1	**21424** - Push Button Assembly, start (includes item 20)
20	1	**21431** - Boot, push button
21	1	**21426** - Push Button Assembly, stop
22	1	**21433** - Pilot Light Assembly
23	1	**21436** - Reset Button Assembly (includes item 24)
24	1	**21431** - Boot, push button
25	1	**21630** - Disconnect Switch Retrofit Assembly (includes handle, rod and switch)
26	1	**21460** - Disconnect Rod Guide (use with the discontinued switch handle 21241, (not required with the retrofit assembly)
27	1	- - Disconnect Switch (order 21630 retrofit assembly)
28	1	- - Extended Shaft (order 21630 retrofit assembly)
29	1	**21445** - Contactor, 60 amp
30	5	**21439** - End Anchor
31	3	**21324** - Fuse Base, 60 amp, cube
32	1	**12930** - Modular Fuse Holder, 2 pole
33	1	**21481*** - Fuse Terminal, 5 x 20 mm
34	2	**21438** - Terminal Block
35	2	**21442** - Grounding Block, size 4
36	1	**21443** - Grounding Block, size 10
37	1	** - Door Gasket (fitting and adhesive required)
38	4	**21270** - Quarter Turn Latch Assembly, Industrial enclosures
-	4	**21271** - Quarter Turn Latch Assembly, Hoffman enclosures
39	1	**11970** - Lock Nut, 3/4", NPT

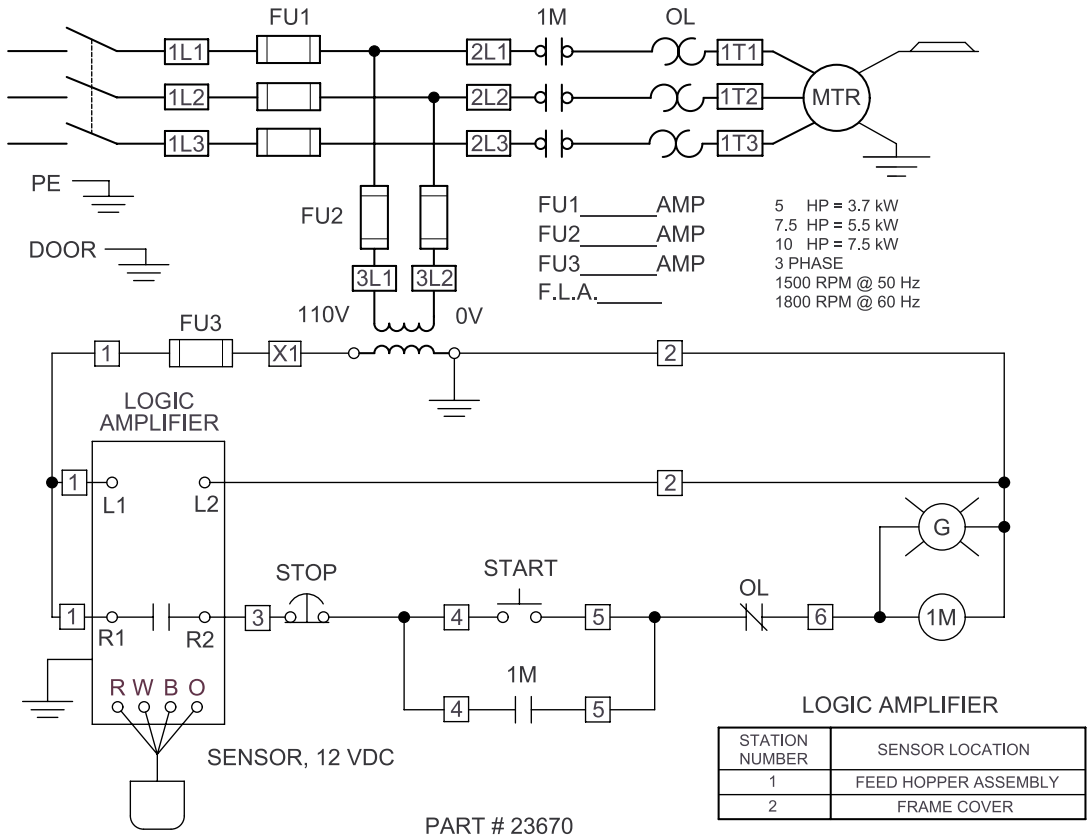
* Not for sale. Part numbers supplied for reference only.
** See the charts on the following pages.
*** Consult the factory.
Electrical assemblies also include safety switches and related parts.

Manual Page Number	Revision

98-113 Parts, Electrical Assembly *(continued)*: Repair parts for previous assemblies, wiring diagram 23670. Use with electrical assembly 23671.

This electrical schematic was used prior to the schematic currently supplied on new machines. See previous pages for the schematics currently supplied on machines.

WIRING DIAGRAM



LOGIC AMPLIFIER

STATION NUMBER	SENSOR LOCATION
1	FEED HOPPER ASSEMBLY
2	FRAME COVER

PART # 23670

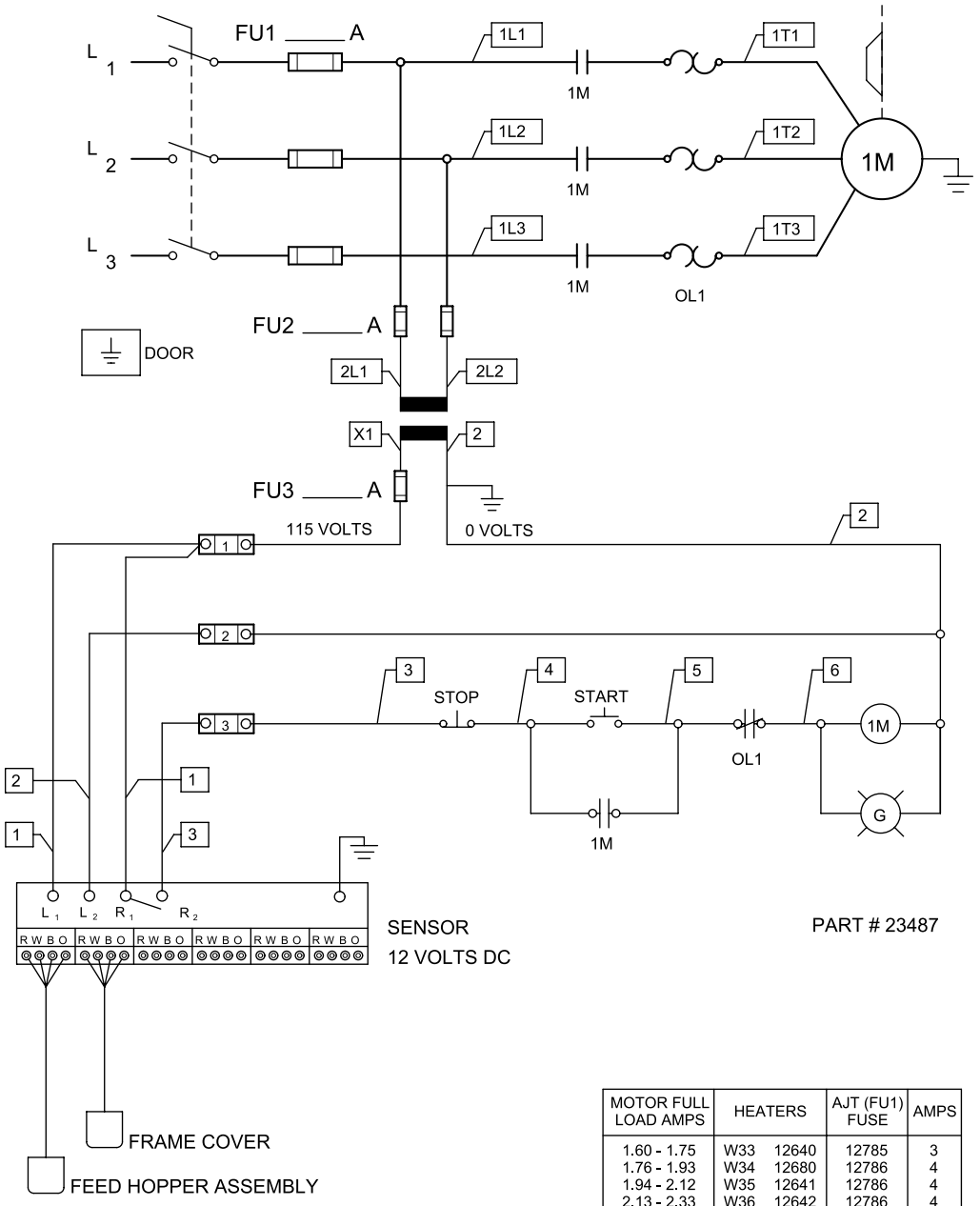
Motor Full Load Amperage	Overload Relay Part Number
.63 - .99	21446
1.00 - 1.29	21447
1.30 - 1.69	21448
1.70 - 2.19	21449
2.20 - 2.79	21450
2.80 - 3.49	21451
3.50 - 4.49	21452
4.50 - 5.99	21453
6.00 - 7.49	21454
7.50 - 9.99	21455
10.00 - 12.99	21456
13.00 - 17.99	21457
18.00 - 23.99	21458
24.00 - 32.00	21459

Motor Full Load Amperage	"Cube" Fuse Part Number	Fuse Size
0 - 1.71	21384	3
1.72 - 3.42	21341	6
3.43 - 5.71	21339	10
5.72 - 8.57	21325	15
8.58 - 10.00	21326	17.5
10.01 - 11.42	21327	20
11.43 - 14.28	21328	25
14.29 - 17.14	21329	30
17.15 - 20.00	21330	35
20.01 - 22.85	21331	40
22.86 - 25.71	21332	45
25.72 - 28.57	21333	50
28.58 - 32.00	21334	60

Where Used	Transformer Part Number	Primary Voltage	Primary Fuse		Secondary Fuse 110-120 volt		Secondary Fuse 24 volt	
			Size	Part Number	Size	Part Number	Size	Part Number
N. America	12927	200-240	1.00	12925	.50	12923	2.50	12922
Elsewhere	12927	200-240	1.00	12929	.50	12923	2.50	12922
N. America	12927	440-480	.50	12926	.50	12923	2.50	12922
Elsewhere	12928	380-415	.50	12924	.50	12923	2.50	12922
N. America	21310	575	.50	12926	.5	12923	2.50	12922

Manual Page Number	Revision
98-113	Parts, Electrical Assembly *(continued)*: Repair parts for previous assemblies, wiring diagram 23487. Use with electrical assembly 23220. Replaces wiring diagram 13723.

This electrical schematic was used prior to the schematic currently supplied on new machines. See previous pages for the schematics currently supplied on machines.



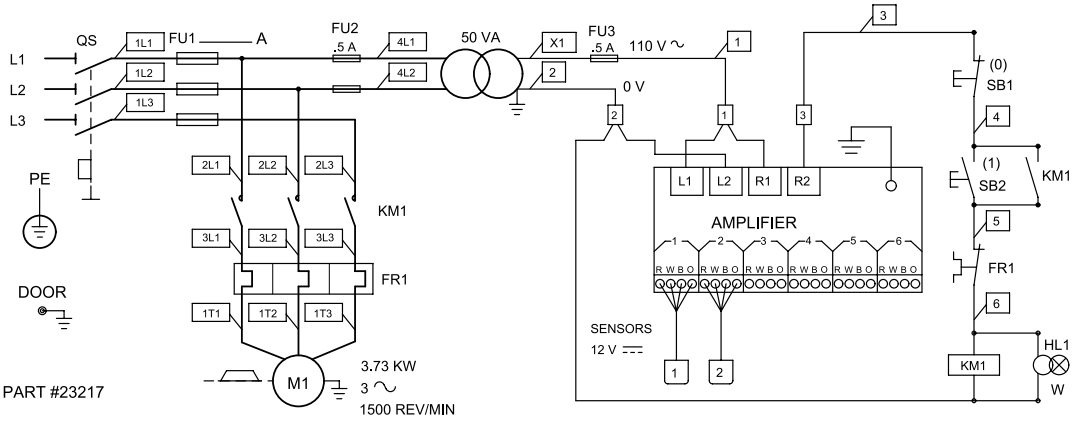
LOCATION	VOLTAGE	FUSE (FU2) PART NO.	AMPS
NORTH AMERICA	208 - 230	12697	1.50
	460	12692	.8
OUTSIDE N. AMERICA	200 - 208	12994	2.00
	220 - 240	12929	1.00

MOTOR FULL LOAD AMPS	HEATERS		AJT (FU1) FUSE	AMPS
1.60 - 1.75	W33	12640	12785	3
1.76 - 1.93	W34	12680	12786	4
1.94 - 2.12	W35	12641	12786	4
2.13 - 2.33	W36	12642	12786	4
2.34 - 2.56	W37	12643	12787	5
2.57 - 2.81	W38	12580	12787	5
2.82 - 3.09	W39	12581	12787	5
3.10 - 3.40	W40	12582	12788	6
3.41 - 3.74	W41	12583	12788	6
3.75 - 4.11	W42	12584	12789	8
4.12 - 4.52	W43	12585	12789	8
4.53 - 4.97	W44	12586	12789	8
4.98 - 5.46	W45	12587	12790	10
5.47 - 6.01	W46	12588	12790	10
6.02 - 6.60	W47	12589	12791	12

Manual Page Number	Revision

98-113 Parts, Electrical Assembly *(continued)*: Repair parts for previous assemblies, wiring diagram 23217 and 23105. Use with electrical assemblies 23218 and 23104. The “AJT Fuse” chart and the “Overload Relay Block” chart in the manual have changed. See the charts below for the current information.

This electrical schematic was used prior to the schematic currently supplied on new machines. See previous pages for the schematics currently supplied on machines.



Use with 23217 schematic.

MOTOR FULL LOAD AMPS	AJT (FU1) FUSE	AMPS
1.94 - 2.12	12786	4
2.13 - 2.33	12786	4
2.34 - 2.56	12787	5
2.57 - 2.81	12787	5
2.82 - 3.09	12787	5
3.10 - 3.40	12788	6
3.41 - 3.74	12788	6
3.75 - 4.11	12789	8
4.12 - 4.52	12789	8
4.53 - 4.97	12789	8
4.98 - 5.46	12790	10
5.47 - 6.01	12790	10
6.02 - 6.60	12791	12
6.61 - 7.26	12791	12
7.27 - 7.98	12792	15
7.99 - 8.78	12792	15
8.79 - 9.65	12793	17 1/2
9.66 - 10.60	12793	17 1/2
10.61 - 11.70	12794	20
11.71 - 12.80	12794	20
12.81 - 14.10	12795	25
14.11 - 15.40	12795	2

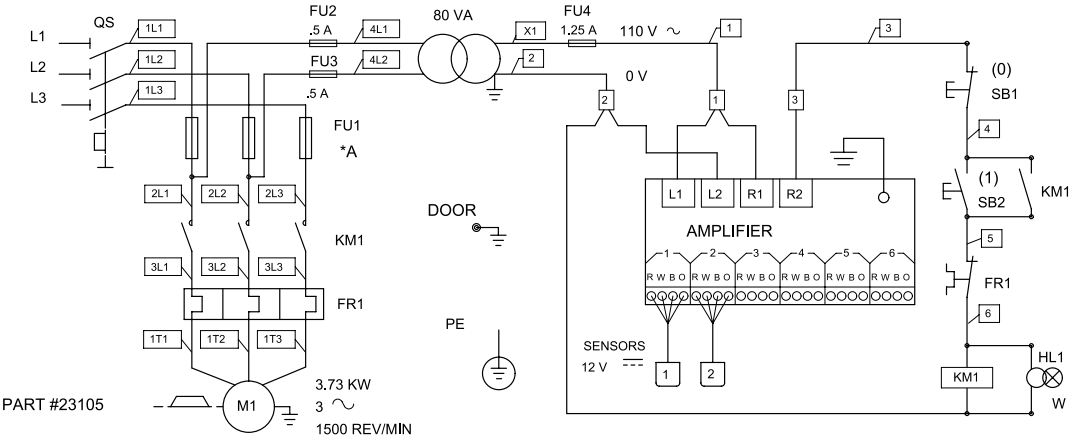
Use with 23105 schematic.

MOTOR FULL LOAD AMPS	CERAMIC TYPE FUSE (FU1) (MILK BOTTLE)		
	ADAPTER SCREW	SCREW CAP	FUSE
4.12 - 4.52	13484	13489	13475
4.53 - 4.97	13484	13489	13475
4.98 - 5.46	13484	13489	13475
5.47 - 6.01	13484	13489	13475
6.02 - 6.60	13484	13489	13475
6.61 - 7.26	13485	13489	13476
7.27 - 7.98	13485	13489	13476
7.99 - 8.78	13485	13489	13476
8.79 - 9.65	13486	13489	13477
9.66 - 10.60	13486	13489	13477
10.61 - 11.70	13487	13490	13478
11.71 - 12.80	13487	13490	13478
12.81 - 14.10	13487	13490	13478
14.11 - 15.40	13487	13490	13478
15.41 - 16.80	13487	13490	13478
16.81 - 18.30	13487	13490	13478

SWITCH LOCATIONS	
SWITCH NUMBER	LOCATION
1	FEED HOPPER ASSEMBLY
2	FRAME COVER

Use with 23217 & 23105 schematics.

OVERLOAD RELAY BLOCK	
MOTOR FULL LOAD AMPS	PART NO.
.25 - .41	13694
.40 - .65	13695
.65 - .99	13696
1.00 - 1.29	13698
1.30 - 1.71	13699
1.72 - 1.79	13699
1.80 - 2.49	13679
2.50 - 2.85	13680
2.86 - 3.42	13680
3.43 - 3.99	13680
4.00 - 4.57	13681
4.58 - 5.49	13681
5.50 - 5.71	13682
5.72 - 7.99	13682
8.00 - 8.57	13683
8.58 - 10.00	13683
10.01 - 11.42	13684
11.43 - 14.49	13684
14.50 - 17.49	13685
17.50 - 20.99	13686



*See schematic inside starter enclosure for fuse amperage.

Manual Page Number	Revision

115

Parts, Safety Signs and Machine Labels: The following replaces the information in the machine manual.

Language*	Language Code*	Label Assembly (includes items 1-6)	Part Number				
			Item 1 Feed Opening	Item 2 Discharge Chute	Item 3 Removed Guard	Item 4 Caution Label	Item 5 Danger Labe, Electrical
English/Spanish	–	23061	11662	11663	11665	11666	11667
Arabic	AR	23798	98113	98115	98117	98125	98121
Chinese	CH	23069	11724	11725	11727	11723	11728
Croatian	CR	23799	98112	98114	98116	98126	98120
Czech	CZ	23178	11868	11869	11871	11872	11873
Danish	DA	23102	11793	11794	11796	11797	11798
Dutch	DU	23068	11716	11717	11719	11720	11721
Estonian	ES	23823	98166	98165	98168	98167	98169
Finnish	FI	23075	11758	11759	11761	11762	11763
French	F	23062	11674	11675	11677	11678	11679
German	GE	23063	11681	11682	11684	11685	11686
Greek	GR	23071	11737	11738	11740	11741	11742
Hungarian	HU	23077	11772	11773	11775	11776	11777
Indonesian	IN	23074	11751	11752	11754	11755	11756
Italian	IT	23066	11702	11703	11705	11706	11707
Japanese	J	23064	11688	11689	11691	11692	11693
Korean	KO	23942	98228	98229	98230	98231	98238
Polish	POL	23070	11730	11731	11733	11734	11735
Portuguese	PO	23065	11695	11696	11698	11699	11700
Russian	RU	23073	11744	11745	11747	11748	11749
Serbian	SB	23072	11109	11110	11112	11108	11854
Slovenian	SL	98405	98348	98347	98350	98349	98351
Swedish	SW	23067	11709	11710	11712	11713	11714
Thai	TH	23227	11946	11947	11949	11950	11951
Turkish	TU	23076	11765	11766	11768	11769	11770
Quantity		1	2	2	4	1	1

Item	Quantity	Part Number and Description
6	**	**12714** - Hazard Alert Label, electrical, 200 volts
		12715 - Hazard Alert Label, electrical, 208 volts
		12716 - Hazard Alert Label, electrical, 220 volts
		12717 - Hazard Alert Label, electrical, 230 volts
		12718 - Hazard Alert Label, electrical, 240 volts
		12719 - Hazard Alert Label, electrical, 380 volts
		12720 - Hazard Alert Label, electrical, 400 volts
		12721 - Hazard Alert Label, electrical, 415 volts
		12723 - Hazard Alert Label, electrical, 460 volts
		12724 - Hazard Alert Label, electrical, 575 volts
	**	**21640** - Hazard Alert Label, electrical, 460Y/266
		21641 - Hazard Alert Label, electrical, 380Y/220
		21642 - Hazard Alert Label, electrical, 400Y/230
		21643 - Hazard Alert Label, electrical, 415Y/240
7	1	**11326** - Urschel Label

* Labels other than English/Spanish contain English in the area for the second language. A language code is printed on labels other than English/Spanish.

** One Hazard Alert Label of corresponding voltage is supplied with the machine.

This page intentionally left blank.

MODEL CC-D
Instruction Manual

1798 NOV 02
(s.s. 1471 JUN 92)

URSCHEL
CORPORATE HEADQUARTERS
1200 Cutting Edge Drive
Chesterton, Indiana 46304 U.S.A.
Corporate: +1.219.464.4811 Fax: +1.219.462.3879
Toll Free: +1.844.URSCHEL (877.2435)
www.urschel.com
Technical Publication inquiries: techpubs@urschel.com
Other inquiries: info@urschel.com
With subsidiaries and sales offices in principal cities worldwide.

This instruction manual contains the most current information available at the time of publication. Urschel Laboratories reserves the right to make changes at any time without notice. This manual represents the machine as it is currently manufactured at the time of publication. If your machine contains parts not shown, or if there are any questions regarding the safe operation of this machine, contact Urschel Laboratories.

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.

contents

(continued)

contents

contents

This page intentionally left blank.

SAFETY

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

This page intentionally left blank.

READ AND PRACTICE SAFETY RULES IN THIS MANUAL:

1. DANGER! This machine contains sharp knives and rotating parts. Never operate this machine if any cover, 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.

5. NEVER attempt to assist the feeding or discharging of product with your hands.

6. Only qualified trained personnel should attempt to clean, adjust, operate, repair or maintain the machine. Proper cleaning and maintenance procedures are found in the maintenance section of this manual.

7. This machine contains protective covers and guards equipped with safety switches. If the machine operates with any of these protective covers or guards opened, removed or modified, this machine is not safe to operate. Call a qualified electrician immediately to locate and repair the fault. Prior to operating the machine, the safety switches must be checked by qualified trained personnel. Complete information on checking safety switches is found in the safety section of this manual.

8. Should the machine become overloaded or jammed, DO NOT attempt to correct the problem with the power source on. **Disconnect and lock out the power source.** Detailed instructions for correcting product jamming are found in the operation section of this manual and should be read and understood by all maintenance, service, or operation personnel.

Safety signs and other protective devices 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 and protective devices, 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 2 — Danger Label, Feed Opening

⚠ **Danger labels** (Figure 2) are placed at or near the feed opening to warn you and anyone near the machine that this opening is an access to sharp rotating parts and pinch points which can cause serious injury. Never insert your hand, a tool, or any foreign object into the feed opening.

Figure 3 — Danger Label, Discharge Chute

⚠ **Danger labels** (Figure 3) are placed on or near the discharge chute to warn you and anyone near the machine that this opening is an access to sharp rotating parts and pinch points which can cause serious injury. Never insert your hand, a tool, or any foreign object into the discharge chute.

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.

Figure 5 — Danger and Hazard Alert Labels

⚠ **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 by a qualified electrician only and the installation must meet applicable codes. The number on the hazard alert label indicates the voltage requirements of the machine.

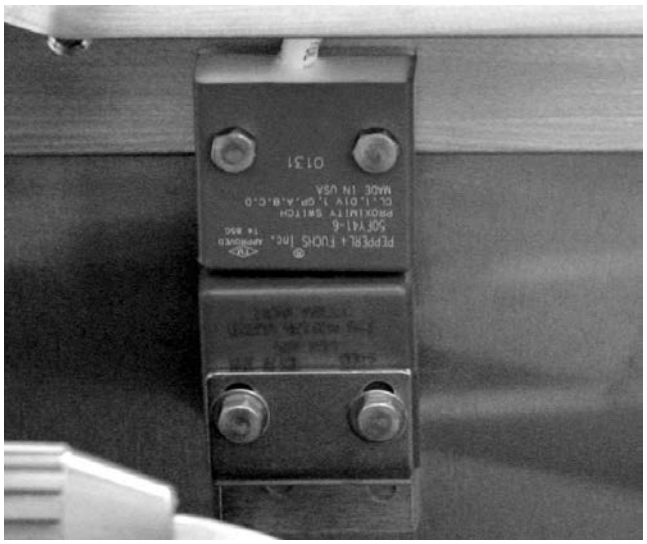


Figure 6 — Safety Switch

⚠ **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.** When machine has come to a complete stop, push the "I" (START) button to verify that the machine will not start before removing any part from the machine.

Figure 7 — Power Disconnect/Lockout Switch

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

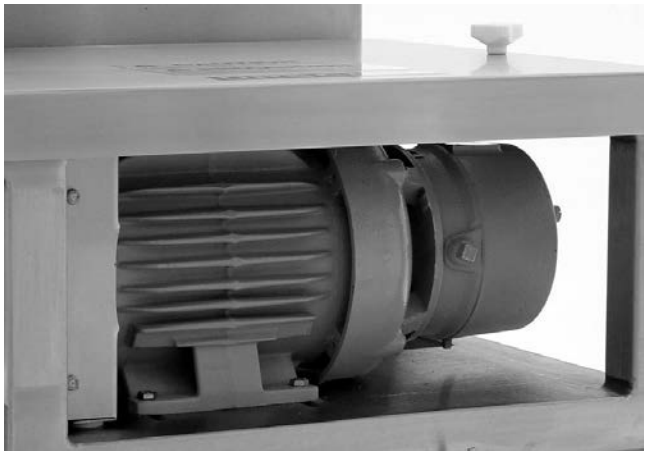


Figure 8 — Brake Motor

⚠ **A brake motor** (Figure 8) is provided to reduce “coasting” stops of potentially dangerous parts of the machine.

⚠ **Covers and guards** enclose potentially dangerous machine areas. These covers and guards are of utmost importance to safe machine operation. ***Never attempt to operate the machine with a cover or guard opened, removed or modified. Serious personal injury may occur!***

Covers and guards, safety signs, safety switches, and brake motors are standard equipment on newly manufactured machines and are available for placement on older machines that may not have had them at the time of original manufacture. Contact Urschel Laboratories for complete information.

See the addendum for updated information

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!***

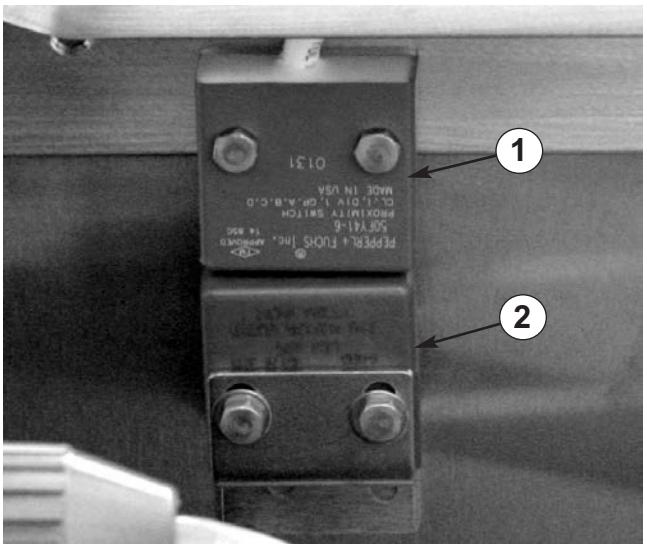


Figure 9 — Safety switch. (1) Sensor, (2) Actuator

SAFETY SWITCH

The safety switch consists of two parts, the sensor and the actuator (Figure 9). Sensors are attached to certain fixed components on the machine and send a signal to the amplifier. Actuators are attached to certain covers and guards and must be aligned and within 1/16" (1.6 mm) of the sensors.

AMPLIFIER

The amplifier, viewed through the starter enclosure window, is an electronic device that processes the sensor signal (Figure 10). Based on the sensor signal, the amplifier will either allow or not allow the machine to start. The amplifier's LEDs help identify possible problems with the safety switches.

Function of the amplifier's LEDs is as follows: when the green "relay condition" LEDs are illuminated, the guards and covers equipped with switches are in place and properly aligned. When one or both of the red "relay condition" LEDs are illuminated, a safety switch circuit is open. When the red "switch output" LEDs are illuminated, they indicate which corresponding safety switch is open.

When the red "attention" LED is flashing, the amplifier has gone into a reset condition. With all sensors and actuators properly aligned, the power to the machine must be turned off and then on again to reset the amplifier. If the amplifier will not reset, call a qualified electrician to locate and repair the fault (see "Amplifier", page 62).

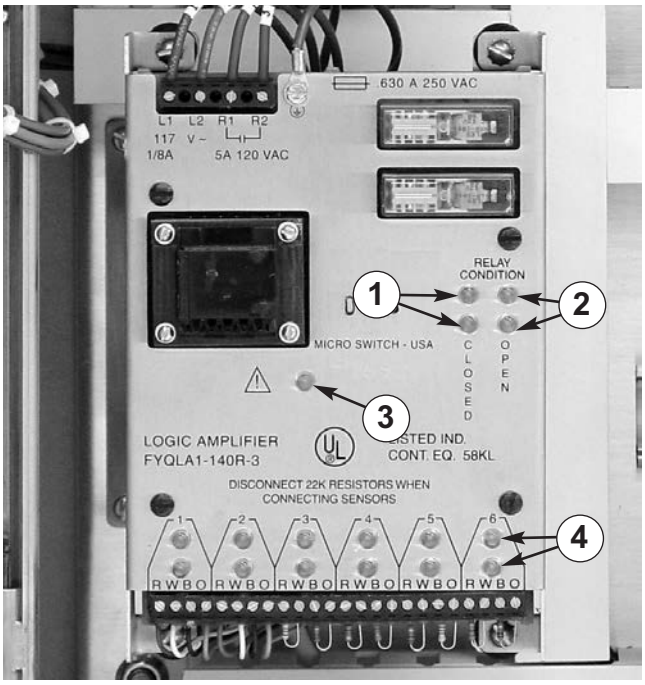


Figure 10 — Amplifier. (1) Green "Relay Condition" LEDs, (2) Red "Relay Condition" LEDs, (3) Red "Attention" LED, (4) Red "Switch Output" LEDs

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 61.***

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 be lit (Figure 11, page 17). Push the "**I**" (START) button. Machine should start. (See "Troubleshooting", page 67 if machine does not start.) Push the "**O**" (STOP) button and turn power disconnect/lockout switch to "**O**" (OFF). Visually verify machine has come to a complete stop.

⚠ **WARNING:** ***Be careful to avoid contact with cutting parts and sharp edges exposed during the safety switch system test. Contact with cutting parts and sharp edges could result in serious injury such as amputation.***

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.

4. **Individually remove or open each additional cover or guard equipped with switch** and repeat steps 2 and 3. Make sure all covers and guards are securely in place and closed after safety switch system has been tested.

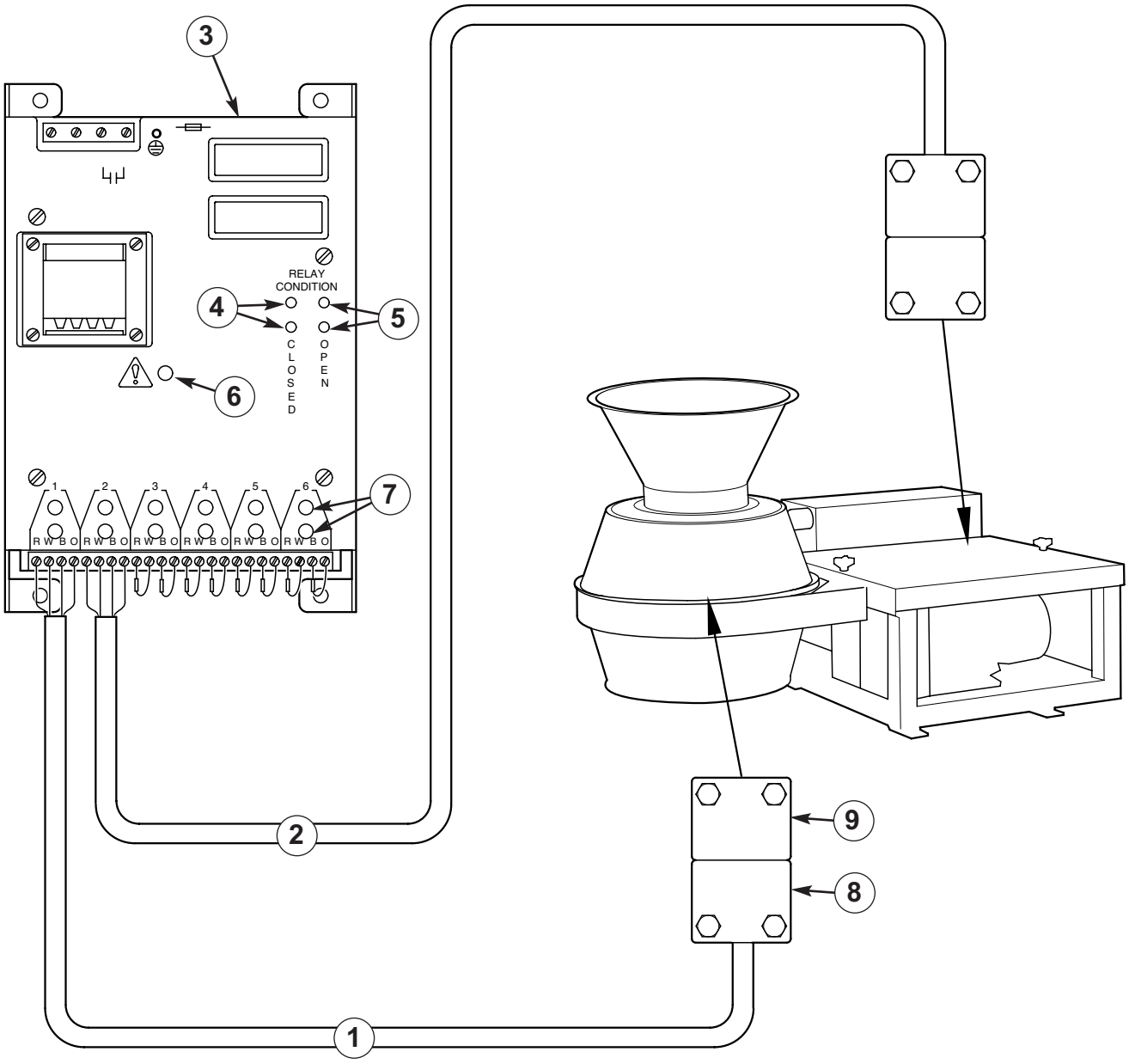
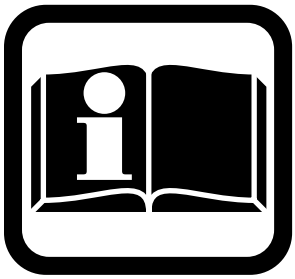


Figure 11 — Amplifier and safety switches with corresponding covers and guards. (1) Feed Hopper Assembly, (2) Frame Cover, (3) Amplifier, (4) Green "Relay Condition" LEDs, (5) Red "Relay Condition" LEDs, (6) Red "Attention" LED, (7) Red "Switch Output" LEDs, (8) Sensor, (9) Actuator

This page intentionally left blank.



GENERAL INFORMATION

SPECIFICATIONS

The **MODEL CC-D** comes equipped with **STAINLESS STEEL** product contact parts. The machine is approved by the United States Department of Agriculture Dairy Division.

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

5 H.P. Machine:
Length:.....48.03" (1220 mm)
Width:.....35.26" (896 mm)
Height:.....29.92" (760 mm)
(See "Dimensional Drawing," page 110.)
Net Weight (approximate):.....530 lbs. (240 kg)
Gross Weight Crated: .....800 lbs. (364 kg)
Gross Weight Export Box: .....900 lbs. (410 kg)

7.5 and 10 H.P. Machines:
Length:.....51.58" (1310 mm)
Width:.....35.26" (896 mm)
Height:.....29.92" (760 mm)
(See "Dimensional Drawing," page 110.)
Net Weight (approximate):.....530 lbs. (240 kg)
Gross Weight Crated: .....800 lbs. (364 kg)
Gross Weight Export Box: .....900 lbs. (410 kg)

Motor: 5 H.P. (3.73 kW), 7.5 H.P. (5.59 kW) or 10 H.P. (7.46 kW) with brake, totally enclosed, fan-cooled. See motor specification plate and motor manufacturer's instructions for more information.

PRODUCT LIMITATIONS

MAXIMUM INPUT PRODUCT SIZE is 3-1/2" (89 mm) in any dimension. Ideal size for cheese is 1-1/2—2-1/2" (38.1–63.5 mm) cubes. Precut product if necessary.

PRODUCT TEMPERATURE for most cheeses should be 35–40°F (1.7–4.4°C). High fat or high moisture cheese may require colder temperature; however, a proper combination of age, fat content and temperature is required for successful cutting.

PROCESSING STICKY OR CANDIED PRODUCT will cause friction in the cutting head assembly.

TRANSVERSE SLICES CANNOT BE PRODUCED from elongated products. Urschel Laboratories manufactures equipment better suited for these applications.

PRODUCTS WHICH ARE EXPLOSIVE or create a potentially explosive atmosphere should not be processed by this machine. A potentially explosive atmosphere could be created if processing your product creates fumes or dust in sufficient concentrations.

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. A machine in good condition will register approximately 81 dB(A) in a free field over a reflecting plane when run at high speed without product and set for 1/16" (1.5 mm) slices. Maximum sound position is measured at 63" (1600 mm) from the floor and 39.37" (1000 mm) from the machine. With the top of the feed hopper assembly at 63" (1600 mm) from the floor, maximum sound position occurs at a point near the feed hopper (Figure 12). Machines set for larger slices will generate less noise when measured under similar conditions.

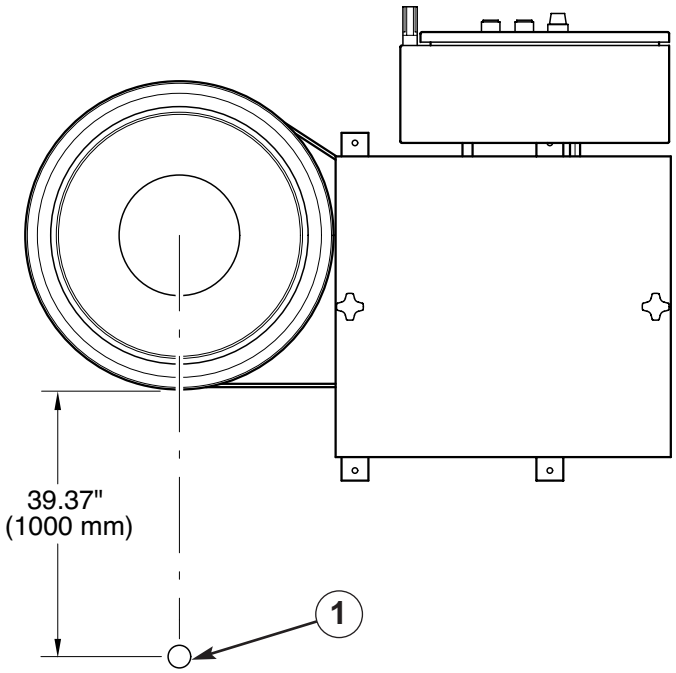


Figure 12 — Top view showing maximum sound position. (1) Measurement Position, 63" (1600 mm) from floor (machine feed height 63" from floor)

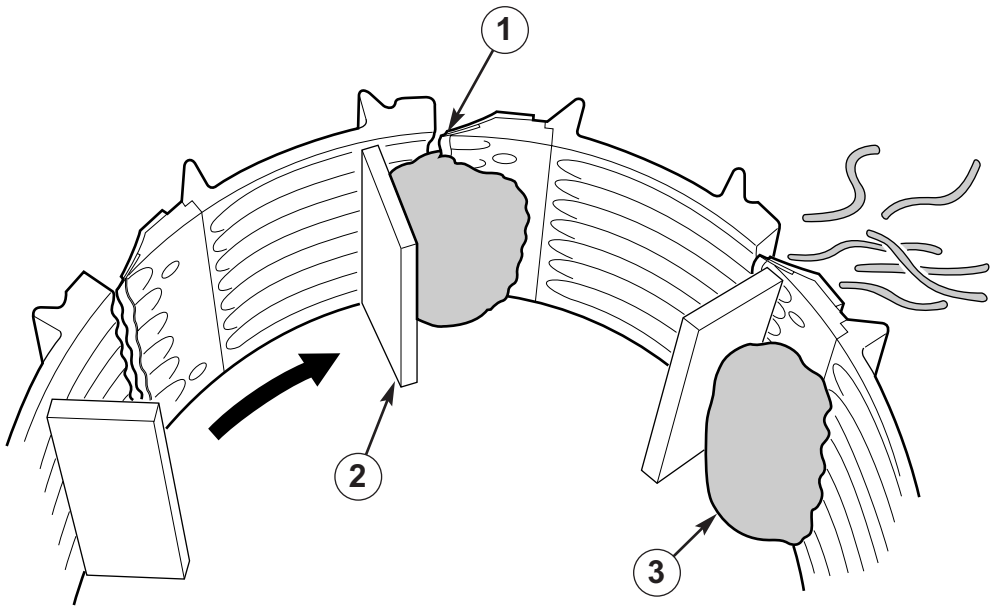


Figure 13 — Cutaway view of cutting head and impeller. (1) Knife, (2) Impeller (448 RPM speed), (3) Product

APPLICATIONS

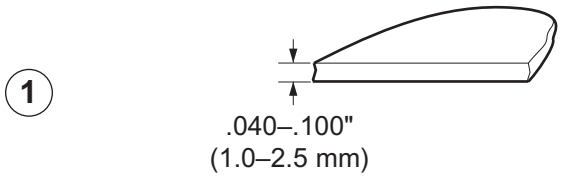
The Model CC-D Shredder is capable of uniformly producing many types of shreds, including “V” shreds, full shreds, oval and wide oval shreds, crescent shreds, slices and strip cuts. Shreds can be made for a variety of applications such as shredding cheese for pizza topping, retail packs, prepared entrees and salads, as well as shredded potatoes for hash browns, and carrots for salad preparations. The versatile Model CC-D features interchangeable cutting heads that enable the processor to change the type of cut in minutes. Specially designed throwaway knives do not require sharpening and are inexpensive and easy to replace. The machine has continuous operation for uninterrupted production and simplified design for easy cleanup and maintenance.

OPERATING PRINCIPLE

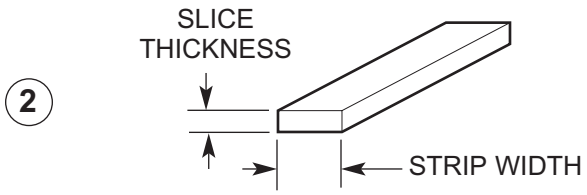
The Model CC-D Shredder utilizes centrifugal force, illustrated above, in its operation. Product delivered to the feed hopper assembly enters the rotating impeller and is held by centrifugal force against the inner surface of the cutting head assembly, which consists of eight individual cutting stations. A shred is produced as product passes each knife in a smooth and uninterrupted manner.

SIZES AND TYPES OF CUTS

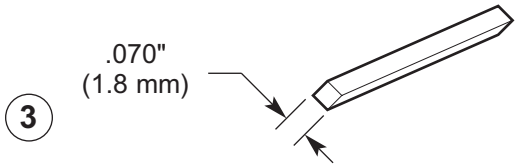
(1) **FLAT SLICE:** Flat slice thicknesses ranging from .040" (1.0 mm) to .100" (2.5 mm) are possible when a flat slicing head is used.



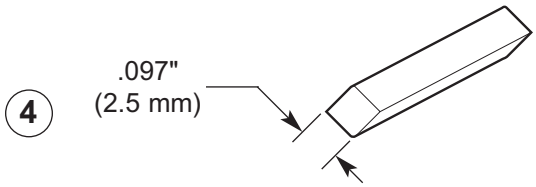
(2) **STRIP CUTS:** Strip cuts are rectangular in cross section. Width is determined by head selection and thickness by slice adjustment (.100" maximum). Widths available: 1/4" (6.4 mm), and 3/4" (19.0 mm).



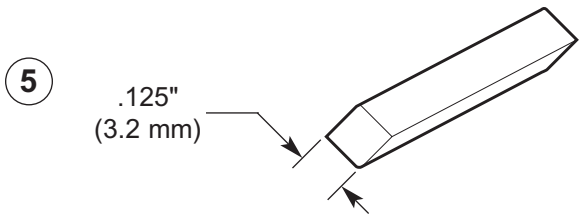
(3) **FULL SHRED, .070:** This type of shred has a cross section measuring approximately .070" (1.8 mm) on each side. This shred is produced with a .125 “V” shred head set at standard setting. Settings greater than standard will produce connected shreds; settings less than standard will produce a “V” shred. See page 24.



(4) **FULL SHRED, .097:** This type of shred has a cross section measuring approximately .097" (2.5 mm) on each side. This shred is produced with a .170 “V” shred head set at standard setting. Settings greater than standard will produce connected shreds; settings less than standard will produce a “V” shred. See page 24.



(5) **FULL SHRED, .125:** This type of shred has a cross section measuring approximately .125" (3.2 mm) on each side. This shred is produced with a .212 “V” shred head set at standard setting. Settings greater than standard will produce connected shreds; settings less than standard will produce a “V” shred. See page 24.

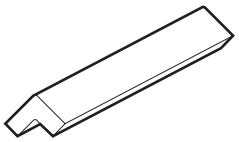


(“Sizes and Types of Cuts”, con’t. on page 24)

("Sizes and Types of Cuts", con't. from page 23)

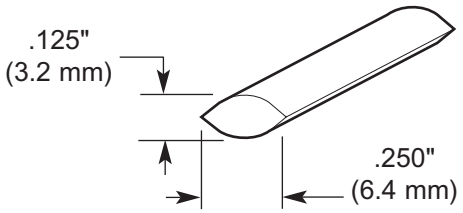
(6) **"V" SHRED:** This type of shred has a "V" shaped cross section. It can be produced with any of the "V" shred heads with the size of the "V" dependent on the head selected and the slice setting adjustment. See "Adjustments", pages 48–49.

6



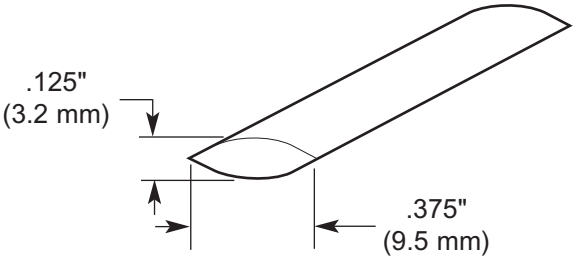
(7) **OVAL SHRED:** This type of shred has an oval-shaped cross section measuring approximately .125" (3.2 mm) thick by .250" (6.4 mm) wide. This size is produced with an oval shred head set at standard setting. Settings greater than standard will produce connected shreds; settings less than standard will produce a crescent shred. See "Adjustments", pages 48–49.

7



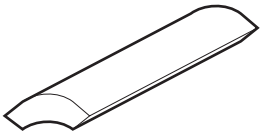
(8) **WIDE OVAL SHRED:** This type of shred has an oval-shaped cross section measuring approximately .125" (3.2 mm) thick by .375" (9.5 mm) wide. This size is produced with a wide oval shred head set at standard setting. Settings greater than standard will produce connected shreds; settings less than standard will produce a crescent shred. See "Adjustments", pages 48–49.

8



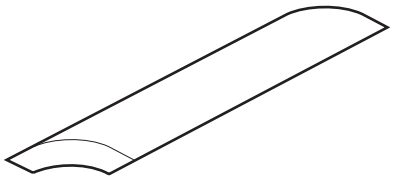
(9) **CRESCENT SHRED:** This type of shred has a crescent-shaped cross section. It is produced with an oval shred head set at less than standard setting. Size of the shred will vary depending on the amount of adjustment made. See "Adjustments", pages 48–49.

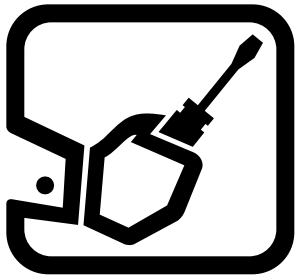
9



10) **WIDE CRESCENT SHRED:** This type of shred has a crescent-shaped cross section. It is produced with a wide oval shred head set at less than standard setting. Size of the shred will vary depending on the amount of adjustment made. See "Adjustments", pages 48–49.

10





INSTALLATION

INSTALLATION

Shipment, Pre-installation, Location

MACHINE SHIPMENT

Every Urschel machine is fully inspected and test-run before it is shipped. The Model CC-D is shipped completely assembled. 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. Remove the feed hopper assembly and visually check the impeller 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 and collecting product. Installation should comply with all applicable safety codes and regulations.

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:** ***Machine will tip if frame is not fastened securely to a stable support. Always remove cutting head and secure frame to lifting forks before moving machine.***

Remove the C-clamps or fasteners which are used in shipping to secure the cutting head to the support ring. Remove the cutting head from the machine (see page 42). Secure machine frame to lifting forks with belts, chains or C-clamps before unfastening the frame from the shipping skid or other mounting surface. Lift machine by the frame from the side opposite the cutting head support (Figure 14).

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

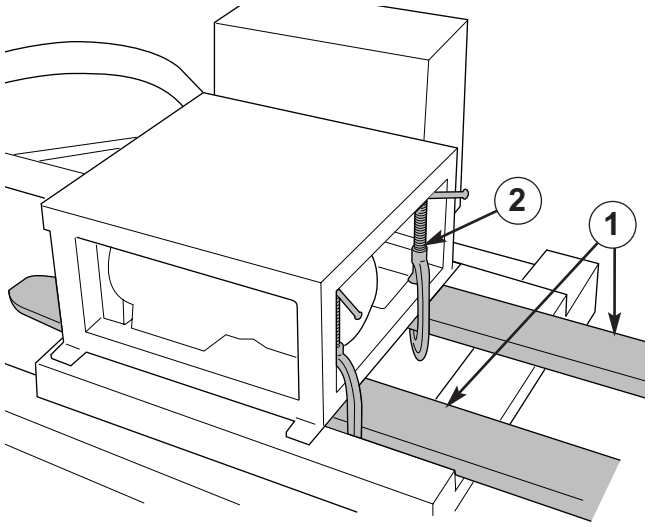


Figure 14 — Always use frame to lift or move machine. (1) Lifting Forks, (2) Clamp

MACHINE MOUNTING

⚠ **WARNING:** ***Machine will tip if frame is not fastened securely to a stable support.***

Fasten machine to a stable support using the bolt holes provided in the frame.

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 15 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 of the starter enclosure.

   NOTE: *Additional holes added to the starter enclosure may lessen the water-tight features of the enclosure and lead to electrical failures. Electrical components that have failed due to water or chemical contamination will not be covered under the warranty.*

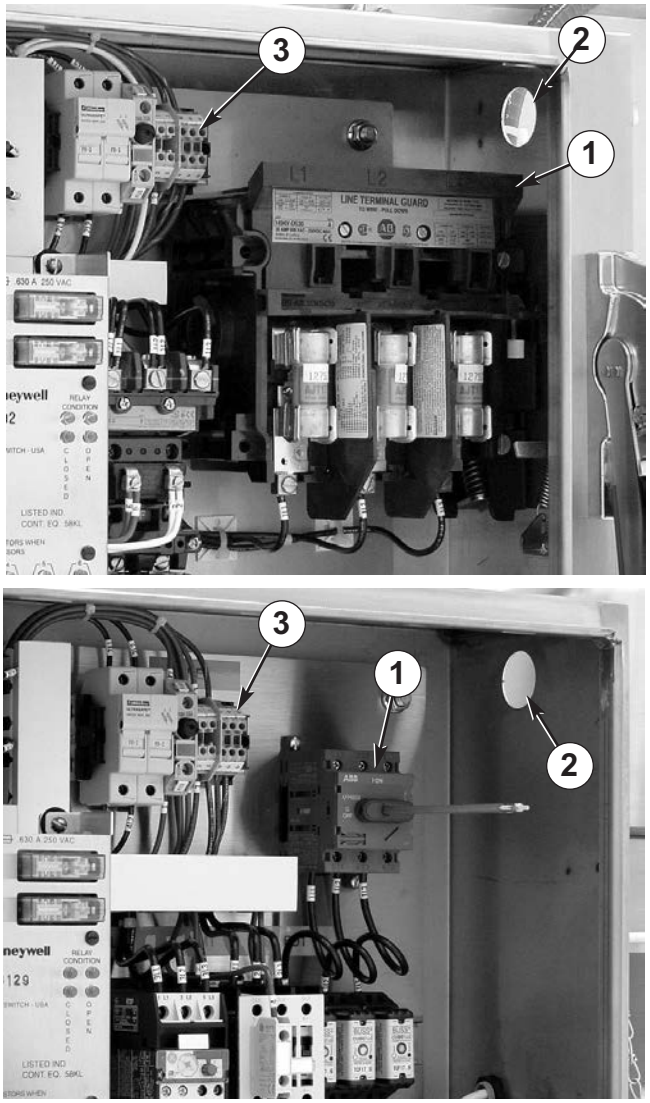


Figure 15 — Interior of starter enclosure (NEMA configuration, top, and CE compliant configuration, bottom). Connect outside power source to the terminals on the power disconnect/lockout switch; connect grounding conductor to the earth termination point. (1) Power Disconnect/Lockout Switch, (2) Power Source Entry Point, (3) Earth Termination Point*

** National Electrical Manufacturers Association*

2. **Connect grounding conductor (green or green and yellow striped wire)** to the earth terminal located on the 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 impeller turns clockwise (Figure 16), when viewed through the feed hopper assembly.

4. **Securely tighten quarter turn latches** on the starter enclosure door when finished with installation.

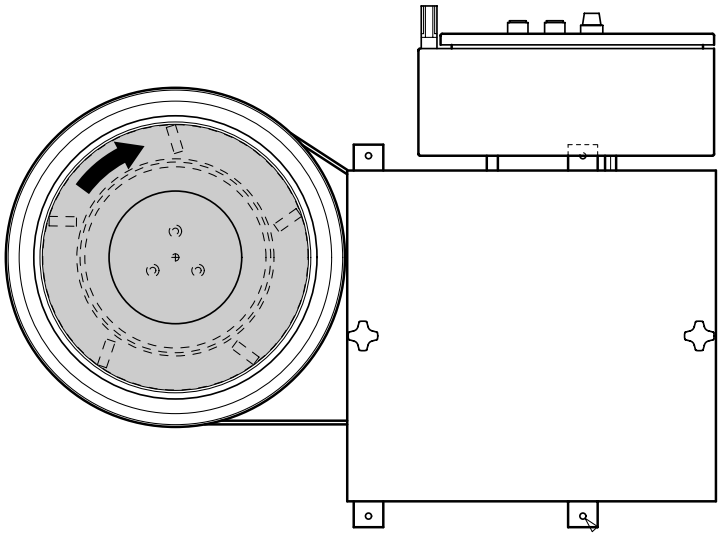
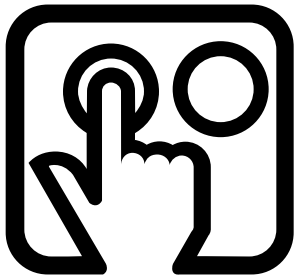


Figure 16 — Top view; connect wiring so that impeller turns clockwise.

This page intentionally left blank.



OPERATION

⚠**WARNING:** ***This machine contains sharp knives and rotating parts. Only qualified trained personnel should operate this machine. 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. Follow all safety rules and instructions outlined in this manual, or serious injury such as amputation could result!***

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 17). 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 16.

⚠ **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!***

3. **Make sure all foreign objects and product have been removed** from the impeller area.

4. **Unlock power disconnect/lockout switch.**

Figure 17 — Read and obey all danger and warning instructions and symbols in this manual and on the machine.

5. **Turn the power disconnect/lockout switch to “I” (ON).** Only the green “relay condition” LEDs on the amplifier should be lit.

6. **Press “I” (START) button.**

7. **Let machine reach full operating speed** before feeding product.

8. **If machine fails to start,** see “Troubleshooting”, page 67.

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 impeller area thoroughly** with a generous amount of water BEFORE stopping the machine. See pages 38–39 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 machine will not start.

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 assembly will produce undesirable cuts and can overload the motor, clog the impeller or jam the cutting unit. Continuous overfeeding or jamming will also cause premature damage and failure of machine components. For best results, products entering the impeller area should not exceed 3-1/2" (89 mm) in any dimension.

Except for an emergency, never start or stop the machine when the impeller is full of product. This puts a tremendous strain on the motor, bearings and cutting parts. In addition, product that is cut before the machine has reached full operating speed may be of such poor quality that it must be discarded.

⚠ **DANGER:** ***Never place hands into feed opening. Doing so can result in serious injury such as amputation!***

MOTOR OVERLOAD

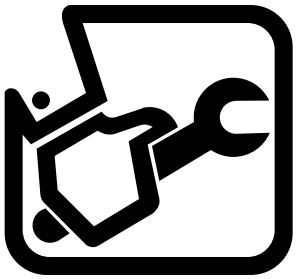
If the motor shuts off during operation, it is likely that it has been overloaded. After maintenance personnel have corrected the problem (allowing at least five minutes for thermal overloads to cool) machine may be restarted by first pressing the “RESET” button on the starter enclosure then starting in the normal manner. If motor again shuts off, see “Troubleshooting’’, page 68.

CORRECTING MACHINE OVERLOAD OR JAM

⚠ **DANGER:** ***Never try to remove jammed product while the machine is running! You may come into contact with cutting parts which could cause severe injury such as amputation!***

1. **Push “O” (STOP) button then disconnect and lock out power source.**
2. **Only qualified trained personnel should proceed to step 3.**
3. **Visually verify that all parts have stopped.**
4. **Push the “I” (START) button and verify machine will not start.** Open or remove covers or guards to expose jammed area.
5. **Remove the obstruction.** ***Keep hands away from cutting parts.***
6. **Remove all product from the feed area** and close or replace all covers and guards.
7. **Machine is ready to restart** and resume feeding product. If proper feeding procedures are followed, product will flow evenly into feed areas.

⚠ **CAUTION:** ***If product continues to jam, DO NOT operate the machine. Contact your supervisor.***



MAINTENANCE

⚠**WARNING:** ***This machine contains sharp knives, rotating parts, and voltages dangerous to life. Only qualified trained personnel should perform maintenance duties on this machine. 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. Follow all safety rules and instructions outlined in this manual, or serious injury such as amputation or death could result!***

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 19, page 37).

Feed hopper assembly: Remove to access cutting parts.

Lower discharge chute: Remove to access impeller drive assembly.

Frame cover: Remove to service drive parts.

Impeller drive shield: Remove to access impeller drive assembly.

Belt guards: Remove to service drive parts.

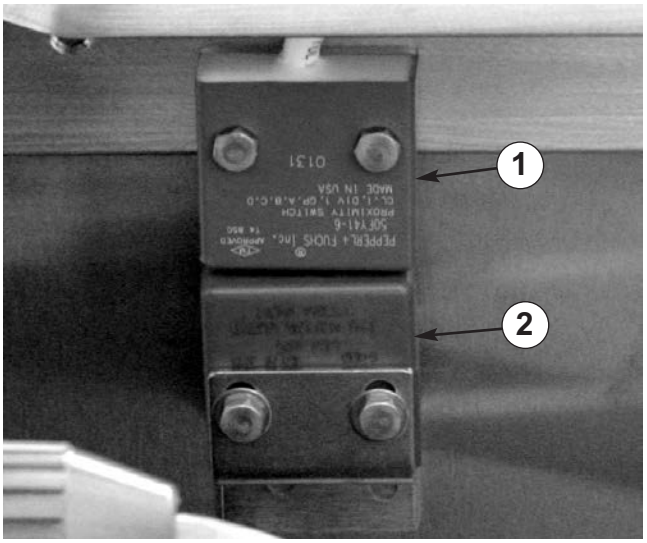


Figure 18 — Safety switch sensors and actuators must be aligned and within 1/16" (1.6 mm).
(1) Sensor, (2) Actuator

INSPECTION

Inspect all covers and guards for damage. Bent or twisted parts will not fit on the machine properly and may prevent safety switches from lining up. Straighten parts or replace if necessary.

INSTALLATION

Replace all covers and guards in their proper locations; replace fasteners and tighten securely. Covers and guards equipped with safety switches must have actuators aligned and within 1/16" (1.6 mm) of sensors to complete safety switch circuit (Figure 18).

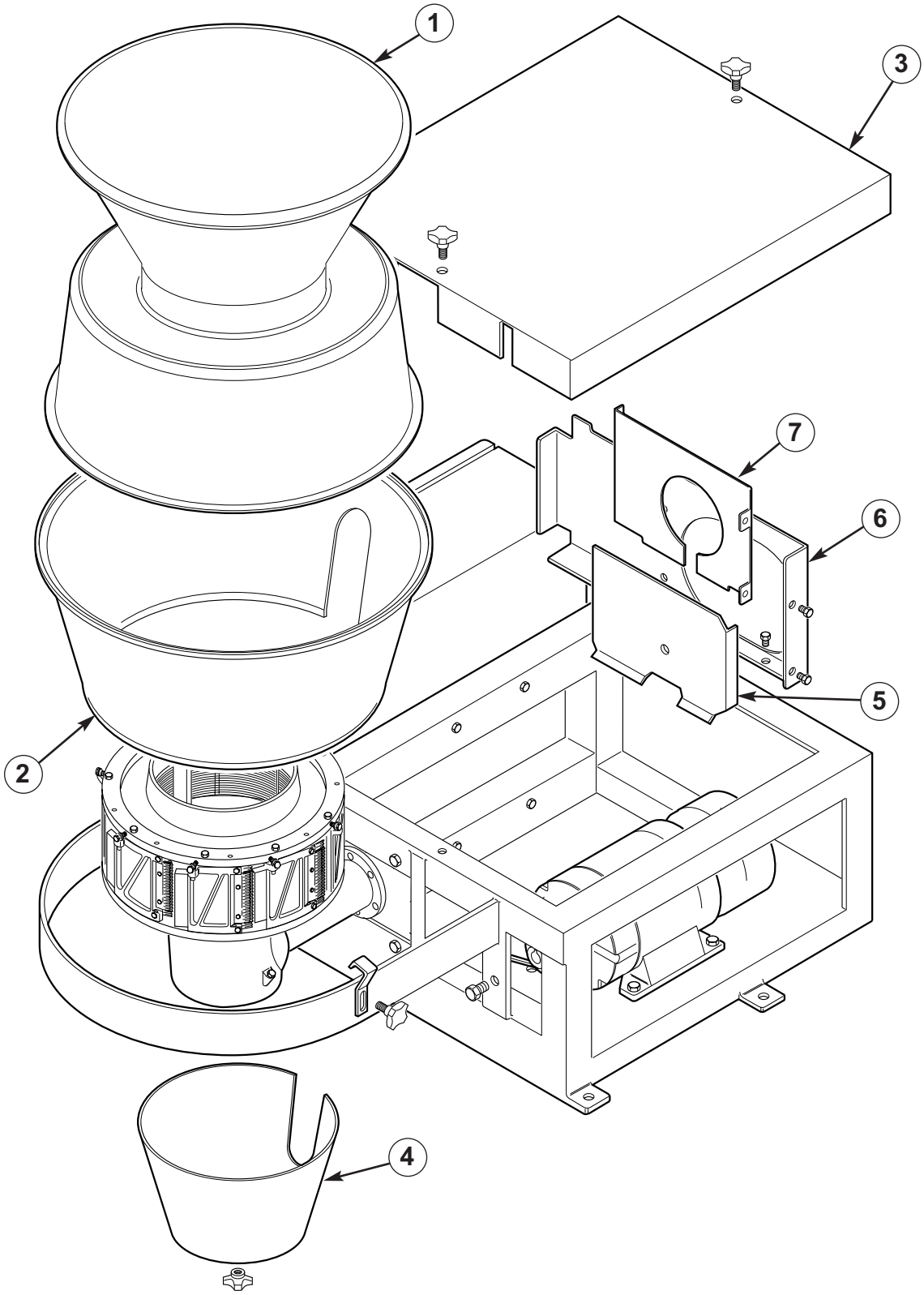


Figure 19 — Covers and guards. (1) Feed Hopper Assembly, (2) Lower Discharge Chute, (3) Frame Cover, (4) Impeller Drive Shield, (5) Belt Guard, (6) Belt Guard, inner, (7) Belt Guard, insert

IMPORTANCE OF DAILY CLEANING

Stainless steel 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 supplies should be suitable for use with 300 and 400 series stainless steel. Excessive solution strength and soaking time or excessive soaking time alone may chemically harm or destroy these and other materials. Solutions containing chlorine or acids can also be harmful. Failure to completely remove these chemicals with an appropriate rinse will cause corrosion.

DAILY CLEANING PROCEDURES

Only qualified trained personnel should clean the machine. When used in the dairy industry under United States Department of Agriculture, Dairy Division, jurisdiction, the following cleaning procedure is **required** daily:

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 solution into feed opening while machine is running.

⚠ **WARNING:** ***Make certain that all covers and guards are in place while machine is running! Maintain a safe distance from machine. Do not insert hose or cleaning tools into feed opening!***

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 feed hopper assembly**, lower discharge chute, impeller drive shield and cutting head assembly. Always rest cutting head upside down on a soft surface, *never* on the dowel pins. Thoroughly wash all sheet metal covers (see "Opening or Removing", page 36.)

5. **Remove impeller.** See "Disassembly", page 42.

6. **Disassemble the cutting head.** See "Disassembly", pages 42 and 44. Remove shoes. Disassemble shoes by removing knife holders, knife clamps, and knives. Thoroughly wash all cutting parts and impeller with water or appropriate cleaning solution. If cleaning solutions are used, rinse thoroughly.

7. **Clean remaining portion of machine.** A forceful stream of water will remove most of the product. Use cleaning solutions when necessary and rinse thoroughly.

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 114–115 for sign placement and part number information.

INSTALLATION

1. **Clean mounting surfaces.** Remove all traces of old sign material and adhesives, oils, cleaning material and water. Remove any nicks or burrs. For machines in cold room temperature, warm the mounting surface so that the label will adhere properly.

2. **Wipe mounting surface of machine** with isopropyl alcohol. (Consult manufacturer's Material Safety Data Sheet for proper handling of isopropyl alcohol.) Remove sign backing and apply label to dry, lint free mounting surface, starting at one end of label and rolling to other end to help avoid air bubbles. For maximum bond strength, rub mounted label with a clean, dry cloth and apply moderate heat (100–130°F, 38–54°C).

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. Keystone KLC®-20 oil, available in five gallon cans, is recommended for the gear case. The lubricant and oil may be purchased from Urschel Laboratories. See “Tools”, page 73.

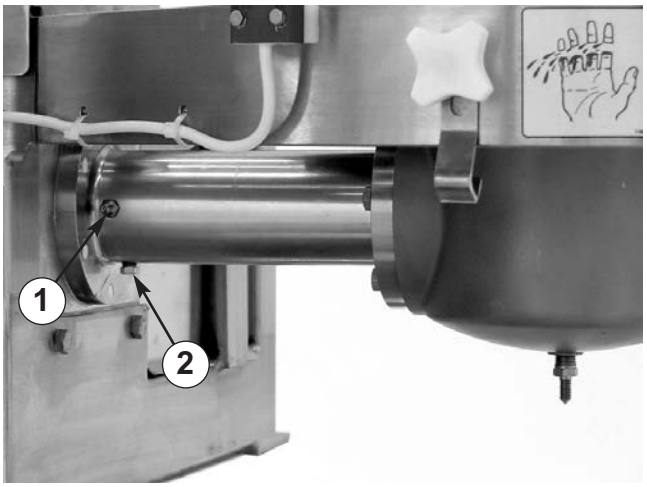


Figure 20 — Lubrication Points. (1) Grease Fitting, (2) Pipe Plug, horizontal bearing housing

LUBRICATION POINTS

The machine has two (2) lubrication points. One grease fitting is located on the impeller drive assembly (Figure 20). An oil filler plug is located on the gear case (Figure 21).

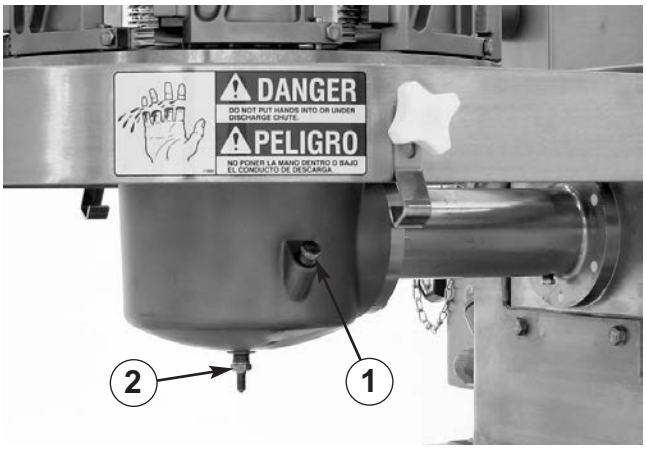


Figure 21 — Lubrication Points. (1) Oil Filler Plug, gear case, (2) Pipe Plug, gear case

LUBRICATION SCHEDULE

1. **At least once per week,** remove the pipe plug in the horizontal bearing housing (Figure 20) and pump grease in through the fitting until any water is forced out. Replace the pipe plug and add two or three pumps of grease to fill the bearings.

2. **Every two weeks,** remove the pipe plug and drain the gear case (Figure 21). Check for the presence of water; oil will have a ‘‘milky’’ appearance. If little or no water is present, the check can be made every three or four weeks. Refill with the recommended oil through the oil filler plug on the side of the gear case. Maintain a level up to the fill hole.

MOTOR LUBRICATION

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

DISASSEMBLY

⚠ **WARNING:** ***Cutting head contains sharp knives! Use extreme caution when handling cutting parts or personal injury can occur.***

The *cutting unit* consists of the cutting head assembly, impeller and cutting head support. To disassemble, refer to Figure 22 and proceed as follows:

1. **Disconnect and lock out power source.** After machine has come to a complete stop, press the "I" (START) button to verify machine will not start. Remove feed hopper assembly and lower discharge chute.

2. **Remove cutting head.** Grasp firmly with both hands and lift straight up. Some cutting heads are held to the support by two hold down screws through opposite shoes (Figure 23). Remove these screws first. Always store the cutting head upside down on a soft surface, never on the dowel pins.

NOTE: ***DO NOT*** *use the aluminum shipping plate for storage purposes. Electrolytic action between aluminum plate and shoes may cause serious corrosion. Mount cutting head on this plate for protection if it is being returned to the factory for repairs.*

3. **Remove impeller.** Unfasten the three screws in bottom plate and lift from impeller shaft.

4. **Remove cutting head support** from gear case by unfastening the eight (8) screws. Cutting head support does not need to be removed to inspect dowel pin holes. See "Inspection", next page.

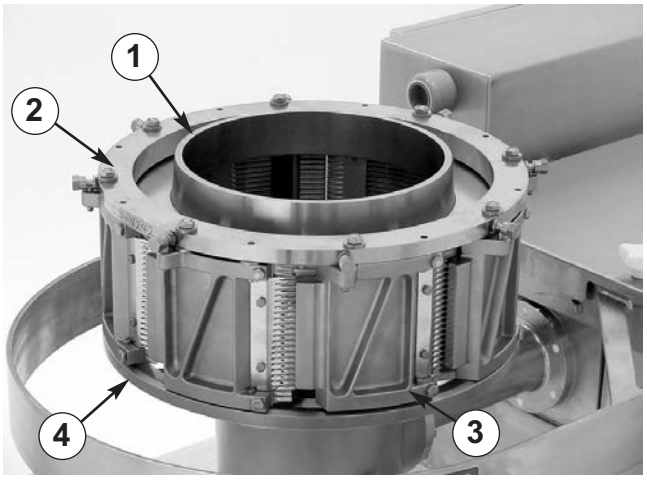


Figure 22 — Cutting unit. (1) Impeller, (2) Cutting Head Assembly, (3) Shoe, (4) Cutting Head Support

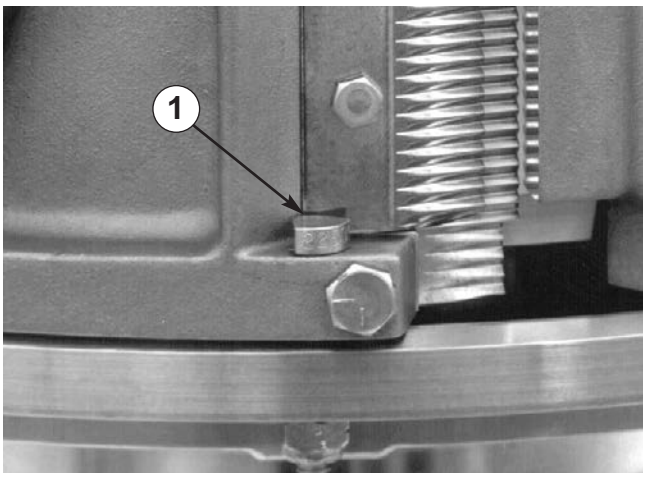


Figure 23 — Cutting head hold down screw. (1) Hold Down Screw

INSPECTION

All parts should be cleaned, inspected for serviceability, and repaired or replaced if necessary.

Cutting head: Inspect locating surface of each shoe for nicks, burrs, or foreign material which could prevent head from resting uniformly on cutting head support. Clean and hone as necessary. Also see “Inspection”, page 44.

Impeller: When impeller paddles have worn to a point where cutting quality is unacceptable, replace impeller.

Cutting head support: If holes for dowel pins are worn to .255" (6.477 mm) diameter or more, shoes will move out of proper position, causing a poor quality cut. Check hole size using pin gauge supplied with machine, (see “Tools”, page 73). If pin goes into hole past the chamfer, cutting head support should be returned to the factory for repair, or replaced. Check top surface for flatness and any raised areas. Return to factory for repair or replace.

REASSEMBLY

1. **Make sure all mating surfaces are clean and free of burrs.**

2. **Install cutting head support.** Place support on gear case and fasten with the eight (8) screws. Use Permatex® Aviation Form-A-Gasket® sealant on the screws to keep water out of gear case.

3. **Install impeller.** Carefully place impeller on impeller shaft dowel pin, aligning the three screw holes. Install lightly greased (food grade) screws and tighten.

4. **Install cutting head.** Carefully lower the head onto support. Slowly rotate the head clockwise until dowel pins drop into the holes in support. If there is any free movement of head on support, inspect holes and locating pins for correct size. Install hold down screws and lock nuts on cutting heads equipped with these fasteners.

   NOTE: *Hold down screws are supplied as spare parts with this machine. These screws fasten the cutting head to the cutting head support and are used, if necessary, when cutting a product that may cause the cutting head to be forced up from the support. The two shoes with hold down screws should be installed opposite each other on the top support ring. See items 13 and 14, page 73.*

5. **Replace lower discharge chute and feed hopper assembly.** Handle sheet metal parts carefully.

See the addendum for updated information

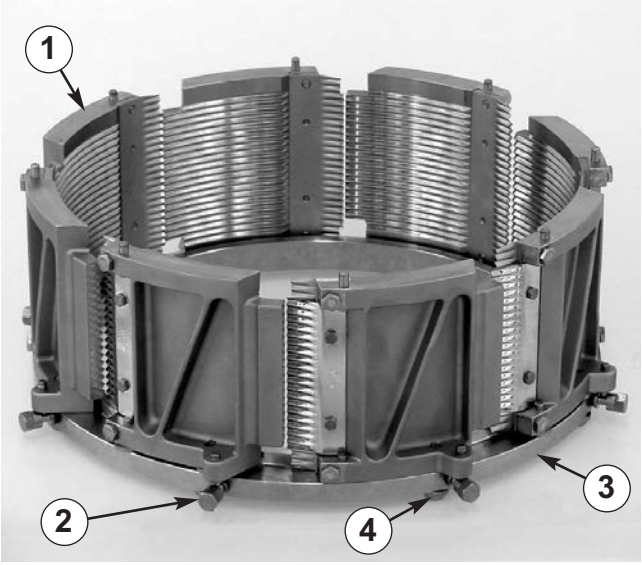


Figure 24 — Cutting head upside down for maintenance. (1) Shoe, (2) Adjusting Screw, (3) Top Support Ring, (4) Fastener for Shoe

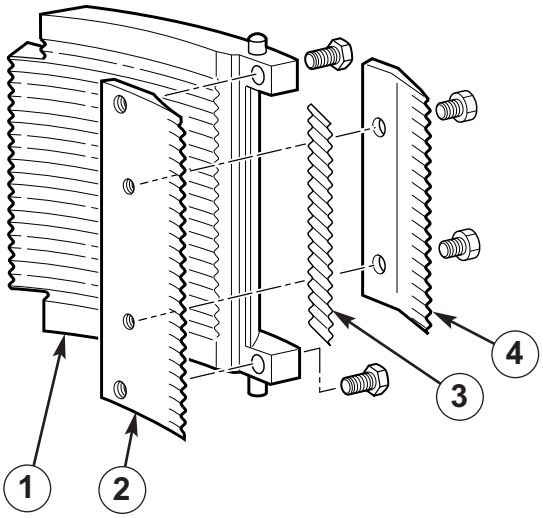


Figure 25 — Typical shredding shoe. (1) Shoe, (2) Knife Holder, (3) Knife, (4) Knife Clamp

DISASSEMBLY

1. **Disconnect and lock out power source.** After machine has come to a complete stop, press the "I" (START) button to verify machine will not start. Remove cutting head and place upside down on a work surface. See "Disassembly", page 42.

2. **Remove shoes.** Extend the cutting head a safe distance beyond the edge of the work bench, enough to allow access to the fastener that holds one shoe (Figure 24). Unfasten the screw and remove the shoe. Rotate the head, removing each shoe. Shred head shoes are alternately attached with spacers to raise every other shoe.
   NOTE: *Keep these spacer washers separate from the washers used with fasteners to attach shoes.*

   Note that the wide oval head assembly does not use spacer washers. Four of the shoes are designed with an offset and are alternated with non-offset shoes. Also, knives fasten directly to the shoes; knife clamps and knife holders are not used (see page 88)

3. **Remove knife clamps and knives.** Two fasteners hold knife clamp to knife holder (Figure 25).

4. **Remove knife holder.** Two screws fasten knife holder to shoe.

INSPECTION

All parts should be cleaned, inspected for serviceability, and repaired or replaced if necessary.

Knives: These knives are intended to be replaced when dull or damaged.

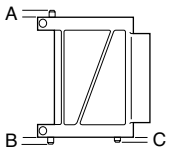
Top support ring: Clean mating surface; hone off any burrs. If holes for pivot pins are worn to .252" (6.401 mm) diameter or more, ring should be replaced. Measure with standard “small-hole” gauge and micrometer. If ring has been dropped or you suspect damage, return ring to factory for inspection.

Knife clamps: Clean with water and a stiff bristle brush. Check for straightness with steel ruler along inner surface of clamp. Compare clamps with profile of an unused clamp. If knife clamp is sprung, bowed or nicked, replace it: do not attempt repair.

Knife holders: Clean with water and a stiff bristle brush. Check for straightness with steel ruler along inner surface of holder. Compare holders with profile of an unused holder. If knife holder is badly nicked, replace it. *Do not attempt repair.*

Shoes: Clean mating surfaces and hone off any burrs. Inspect dowel pins for wear, replacing only when absolutely necessary. When installing new pins, the .125" or .250" dowel pin gauge block (see “Tools”, page 73) should be used either alone or in combination with the shredding shoe spacer to measure proper pin extension (Figure 26). Shoes with loose pins should be replaced.

Check for shoe wear by placing a steel ruler on the inner surface of the shoe from top to bottom. If the gap at the mid point of the ruler is .002" (.051 mm) or greater, replace the shoe. If inner surface of shoe wears below knife holder, shoes should be replaced. If there is a gap between shoe and knife holder measuring .002" (.051 mm) or greater, replace the shoe.



	PIN EXTENSIONS (in inches)		
	A	**B**	**C**
SLICING SHOES	.250	.250	.125
STRIP CUTTING SHOES	.250	.250	.125
OVAL SHRED SHOES — used with .150 spacers	.250	.400	.275
OVAL SHRED SHOES — used without spacers	.400	.250	.125
WIDE OVAL SHRED SHOES	.250	.250	.125
.125 V SHRED SHOES — used with .0625 spacers	.250	.313	.188
.125 V SHRED SHOES — used without spacers	.313	.250	.125
.170 V SHRED SHOES — used with .085 spacers	.250	.335	.210
.170 V SHRED SHOES — used without spacers	.335	.250	.125
.212 V SHRED SHOES — used with .106 spacers	.250	.356	.231
.212 V SHRED SHOES — used without spacers	.356	.250	.125

Figure 26 — Pin extension chart

NOTE: *.125 shred shoes are used to obtain .070 full and V shred cut sizes, .170 shred shoes are used to obtain .097 full and V shred cut sizes, and .212 shred shoes are used to obtain .125 full and V shred cut sizes. See “Cutting Heads”, pages 82–86.*

REASSEMBLY

1. **Place a small amount of grease (food grade) on the fasteners** to make future removal easier.

2. **Install knife holder.** Fasten to the shoe with screws, making sure holder is firmly against its seat while tightening. Check for proper seat with .0015" feeler gauge supplied with the machine (Figure 27). Gauge should not fit between the two mating surfaces.

3. **Install knife.** FLAT KNIVES — locate on the two pins on knife holder, either side up.
   CRINKLE OR V-CUT KNIVES — center knife on knife clamp. It will not center if the knife is upside down.
   STRIP CUTTING KNIVES — install flat knife and then strip cutting knife on the pins.
   WIDE OVAL KNIVES — fasten to the shoe with screws, making sure knife is firmly against its seat while tightening. Check for proper seat with .0015" feeler gauge supplied with machine. Gauge should not fit between the two mating surfaces. Wide oval shred assemblies do not have knife holders or knife clamps.

4. **Install knife clamp.** FLAT KNIVES — fasten clamp over knife and tighten the two screws alternately until they stop. Clamp pressure should force knife into the radius of the holder.
   CRINKLE OR V-CUT KNIVES — place knife and clamp together on knife holder. Install and lightly tighten screws. Use wood block provided to hold knife tightly against its seat while tightening screws until they stop (Figure 28) — 45–50 inch pounds (5.08–5.65 newton-meters).

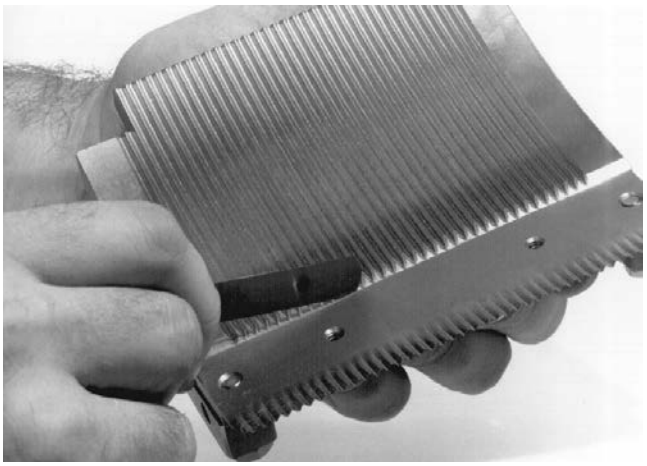


Figure 27 — Checking seat on knife holder

Figure 28 — Installing knife and knife clamp and tightening screws. (1) Knife Clamp

5. **Turn adjusting screws** until inside shoulder is 1/16" (1.6 mm) from top support ring (Figure 29).

6. **Install preassembled shoes.** Set pivot pin in proper hole with adjustment pin between the shoulders of the adjusting screw.

   NOTE: *On shred heads, every other shoe will have longer extension on the pivot and adjustment pins. Install these shoes with the proper spacers. See Figure 26, page 45. Note that this does not apply to the wide oval assembly.*

7. **Fasten shoes** from the bottom of the ring with the screw and special washer. Tighten screw enough to hold shoe firmly, but loose enough to make slice thickness adjustment. If hold down screws are being used, the two shoes with hold down screws should be installed opposite each other on the top support ring.

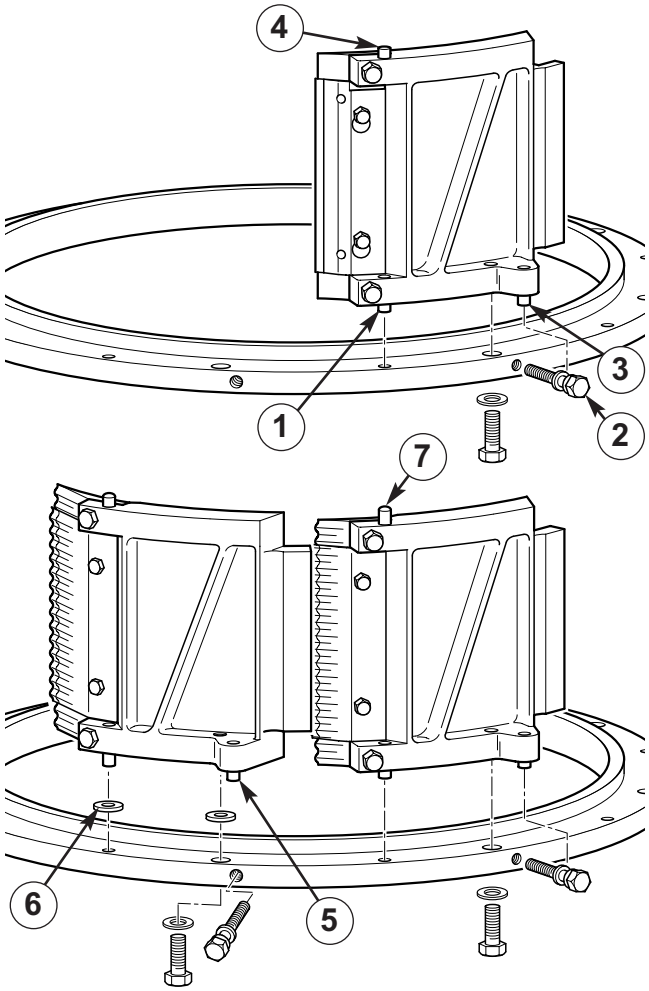


Figure 29 — Installing slicing shoes (top) and shredding shoes (bottom). (1) Pivot Pin, (2) Adjusting Screw, (3) Adjustment Pin, (4) Locating Pin, (5) Shoe with longer pin extensions toward spacers, (6) Spacer, (7) Shoe with longer locating pin

ADJUSTMENTS

Slice Thickness Setting Gauge:

NOTE: *Before adjusting shred thickness, set slice thickness setting gauge with the setting block (Figure 30).*

1. **Loosen locking screw.** Turn adjusting screw so gauge moves up.

2. **Select proper setting block** (see page 75). For shredding, note that full shreds are obtained when using the standard setting (STD) on the setting block. Hold setting block tightly against bottom of gauge so protruding step is under gauge tip.

3. **Turn adjusting screw until indicator needles point to zero,** about 1/4 revolution.

4. **Tighten locking screw.** If needle moves slightly off zero, loosen clamp screw and rotate dial to set zero to the needle, then retighten clamp screw. *Do not* overtighten clamp screw; overtightening can damage the dial.

5. **Remove and reposition setting block several times** to make sure the zero setting has been obtained.

If desired slice thickness is slightly different than the setting block, follow this example: to set a slice thickness of .062" using a .060" setting block, loosen clamp screw. Move dial .002" to the right. For .058" move dial .002" to the left. Retighten clamp screw.

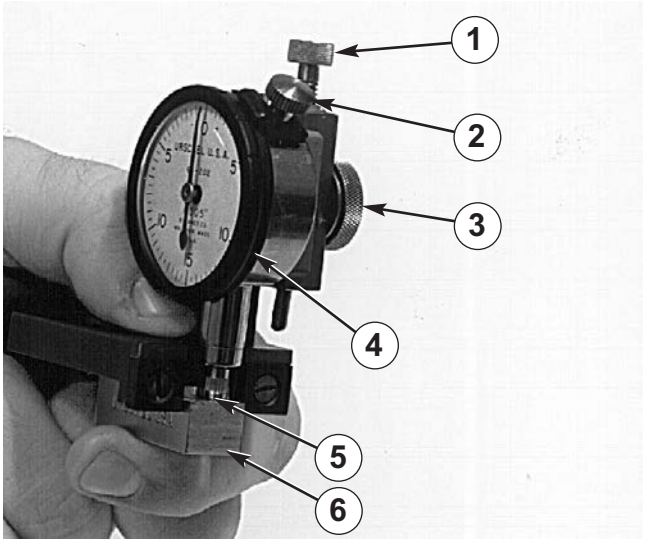


Figure 30 — Slice thickness setting gauge. (1) Adjusting Screw, (2) Clamp Screw, (3) Locking Screw, (4) Dial, (5) Gauge Tip, (6) Setting Block

Crescent and modified “V” shreds are obtained by setting the shred thickness at less than standard size. Settings greater than standard will produce connected shreds. Setting blocks for shredding have steps for the more common sizes.

NOTE: *Actual thickness of cut may vary depending on size, density and type of product. Further adjustment may be necessary to achieve a precise thickness.*

Shred Thickness:

1. **Place cutting head assembly upside down and extending a safe distance beyond the edge of work surface.** Mark one shredding shoe as the starting point. Loosen screws holding the shoes just enough to allow shoe to move when making slice thickness adjustment.

2. **Position pre-set slice thickness setting gauge** flat against shoe as shown in Figure 31. (See “Adjustments”, previous page, to set gauge.) Adapter blocks are used between the gauge and the ring on some shredding shoes (Figure 32). Adapter blocks serve to keep the gauge tip on the peak of the knife corrugation. Slide gauge forward until the gauge tip rests on knife edge. Adapter blocks and dowel pin gauges used below are listed on page 73.

   Slicing, strip cutting and full shred (.070) heads — place gauge directly on support ring.

   Full shred (.097) heads — Use the 22834 .125 dowel pin gauge block between support ring and gauge when measuring to a knife on a shoe with spacers.

   Oval and full shred (.125) heads — place the 22133 adapter block between support ring and gauge when measuring to a knife on a shoe with spacers.

   Wide oval heads — place the 22133 adapter block between support ring and gauge when measuring to a knife on an offset shoe (shoe with most corrugations). Use 22133 adapter block and 22835 .250 dowel pin gauge block together between support ring and gauge when measuring to a knife on a shoe with least corrugations.

3. **Turn adjusting screw on cutting head** until the indicator needle comes up to zero. Adjustment to zero should always be on the way in with the screw. If dial goes past zero, back screw out and start over.

4. **Rotate head one shoe *counterclockwise*** and repeat procedure.

5. **Adjust three or four shoes past starting point** to cancel out any accumulated error.

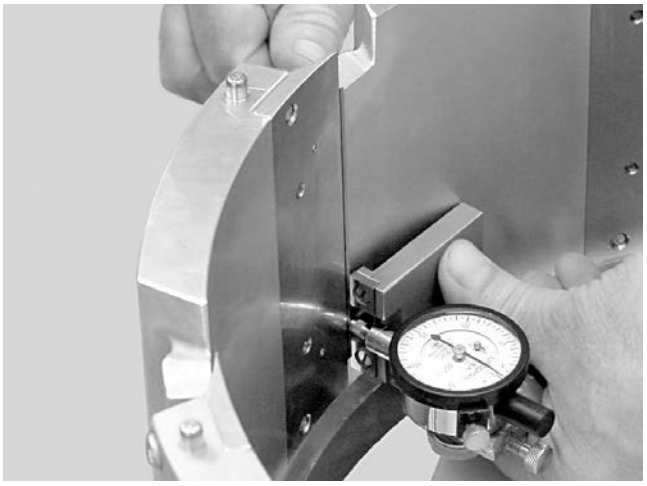


Figure 31 — Setting slice thickness

Figure 32 — Using adapter block. (1) Adapter Block

6. **Tighten screws that hold shoes** to 80–90 inch pounds (9.04–10.17 newton-meters).

7. **Recheck with gauge** to be sure that tightening the screws did not change the setting.

8. **Install cutting head, replace lower discharge chute and feed hopper assembly** (see “Reassembly”, page 43). Cut a small amount of product as a test and measure the samples. If measurement varies from the desired result, adjust setting gauge by the amount that samples were over or under and readjust cutting head.

See the addendum for updated information

REPAIR

NOTE: *URSCHEL LABORATORIES URGES ALL CUSTOMERS TO RETURN IMPELLER DRIVE ASSEMBLIES IN NEED OF REPAIR TO THE FACTORY FOR THESE REASONS:*

1. Our repair department is equipped with fixtures and equipment specially built for this purpose. Reassembly is done in a special “Clean Room” to minimize dust and dirt contamination.

2. Further damage can occur if the disassembly procedure is not done correctly. This is costly to the customer.

3. Potentially reusable parts must be examined and measured to less than one thousandth of an inch. A well-equipped machine shop and skilled personnel must be available to do this correctly. If this is not done, the repair will not be successful and the impeller drive assembly will fail again.

4. Our personnel use their knowledge and experience to not only repair, but also determine when possible the cause for failure. The customer can then make the adjustments in operation to avoid future problems. “Down time” is minimized and repair costs will be less.

5. **Exchange Program:** Because the complete impeller drive assembly is a costly item, many customers choose not to keep a spare unit in stock. In order to minimize down time without having to bear the cost of a new assembly, Urschel Laboratories offers an exchange program. A supply of rebuilt impeller drive assemblies are kept on hand at all times to be shipped within hours of customer’s request. The cost of an exchange assembly is based on parts and labor required to restore the customer's returned assembly to acceptable rebuilt condition. For further information contact the service department at Urschel Laboratories (219-464-4811).

NOTE: *The factory exchange program is available in the U.S.A. and Canada only.*

If your maintenance department has the skill and equipment and your company wishes to repair impeller drive assemblies, detailed instructions can be found on pages 54–60. Removal and installation instructions are on pages 51–52.

INSPECTION

Inspect impeller drive assembly for internal wear as follows:

1. **Disconnect and lock out power source.** After machine has come to a complete stop, press the “I” (START) button to verify machine will not start. Remove feed hopper assembly and frame cover.

2. **End play for the impeller drive pulley** must be set properly before inspection, see “Adjustments”, page 53.

3. **Rotate shafts.** If tight or rough spots are detected, drive assembly should be repaired.

4. **Hold impeller drive pulley firmly and rotate impeller back and forth**. More than 1/16" (1.6 mm) play measured at outside diameter of impeller means that impeller drive assembly has excessive wear.

5. **Check impeller shaft** for up and down movement. Gripping impeller, pull up and down several times. Any movement indicates bearings must be replaced.

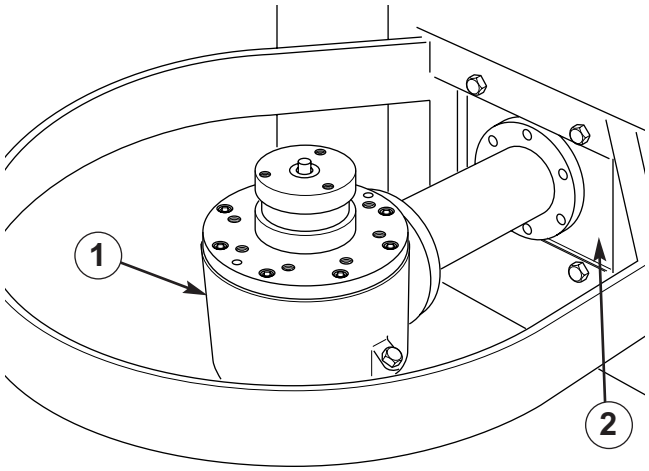


Figure 33 — Impeller drive assembly. (1) Impeller Drive Assembly, (2) Support Plate

REMOVAL

1. **Disconnect and lock out power source.** After machine has come to a complete stop, press the “I” (START) button to verify machine will not start. Remove feed hopper assembly, lower discharge chute and impeller drive shield. Remove cutting head, impeller, cutting head support and frame cover.

2. **Remove motor mounting bolts.** Slide timing belt off timing pulley, then slide motor away from belt guard. Remove belt guard and timing pulley.

3. **Drain oil** by removing drain plug in bottom of gear case. Remove the six (6) screws holding impeller drive housing to support plate. Slide impeller drive assembly out (Figure 33). Generally, it is not necessary to remove support plate.

⚠ **WARNING:** ***Impeller drive assembly is heavy, weighing approximately 60 lbs (27 kg)!***

See the addendum for updated information

INSTALLATION

NOTE: *Removing the support plate is generally not necessary. If the plate has been removed, seal the entire mounting surface with silicone sealant during installation. Seal under the heads of the cap screws with sealant.* ***Leave no bead.***

1. **Slide impeller drive assembly** into support plate. Replace fasteners but do not fully tighten at this time.

2. **Place cutting head support on gear case.** Use Permatex® Aviation Form-A-Gasket® sealant on fasteners.

3. **Level impeller drive assembly.** Place straight edge across top of cutting head support and equalize distance on both sides from straight edge to band on frame (Figure 34). Tighten impeller drive assembly to support plate.

4. **Lubricate impeller drive assembly** according to instructions in “Lubrication”, pages 40–41.

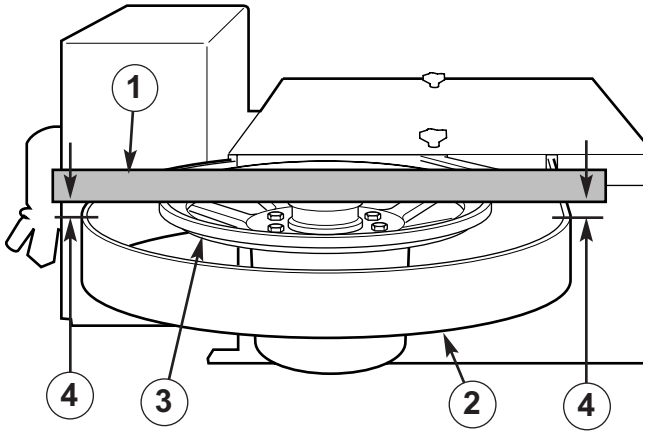


Figure 34 — Level impeller drive assembly. (1) Straight Edge, (2) Band, (3) Cutting Head Support, (4) Measure

5. **Install timing pulley and adjust pulley “end play”,** (see “Adjustments”, page 53). Install belt guard. Replace motor mounting bolts. Install timing belt and adjust tension.

6. **Replace frame cover, impeller, cutting head, lower discharge chute, impeller drive shield and feed hopper assembly.**

ADJUSTMENTS

Impeller drive pulley "end play": Set a .004" clearance between bearing housing and timing pulley with a feeler gauge (see "Tools", page 73). Keep shaft pulled out as far as it will go during this adjustment. Tighten pulley set screw, Figure 35.

Motor timing pulley: Adjust in or out on shaft to align with impeller drive pulley. Tighten pulley set screw.

Timing belt tension: Loosen motor mounting bolts and slide motor. Replacement belt must match original belt. Motor pulley must be parallel with impeller drive pulley.

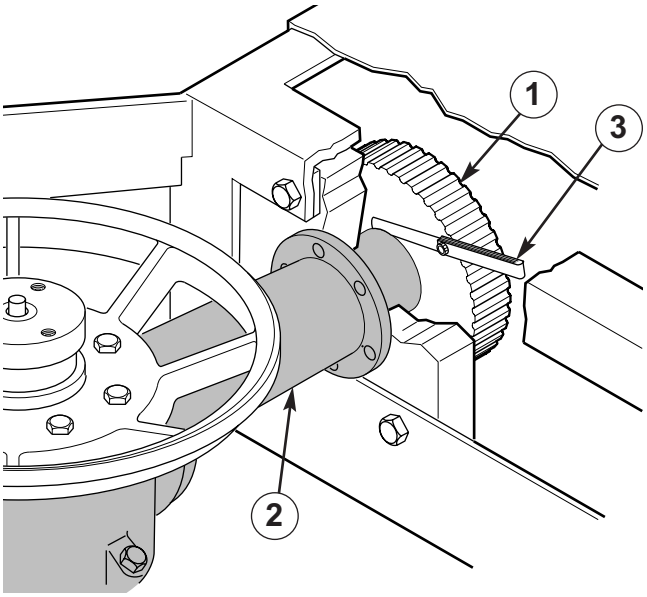


Figure 35 — Set end play of .004" between housing and pulley. (1) Impeller Drive Pulley, (2) Bearing Housing, (3) Feeler Gauge

DISASSEMBLY

Urschel Laboratories recommends that impeller drive assemblies be returned to the factory for repair, see page 50. For customers choosing to rebuild this assembly, the following repair instructions must be followed precisely for successful repair. Refer to Figure 36 and see ‘‘Impeller Drive Assembly’’, page 78, for part number information.

The following tools and parts are recommended:

Magnetic base indicator
Brass rod, 3/8 x 5"
Parallels, 3/8 x 1/2 x 6"
Depth micrometer, 4–5" and 0–1" depth
Bearing pusher (available from Urschel Laboratories, see “Tools”, page 73)
Brass or aluminum rod, 1" diameter x 12" long
Bearing puller or wheel puller with bearing attachment
Arbor press
Spanner wrench
Several sets of shims, (see “Impeller Drive Assembly”, page 78)
Chevron FM® grease no. 2, (see “Tools”, page 73)
Permatex® Aviation Form-A-Gasket® sealant

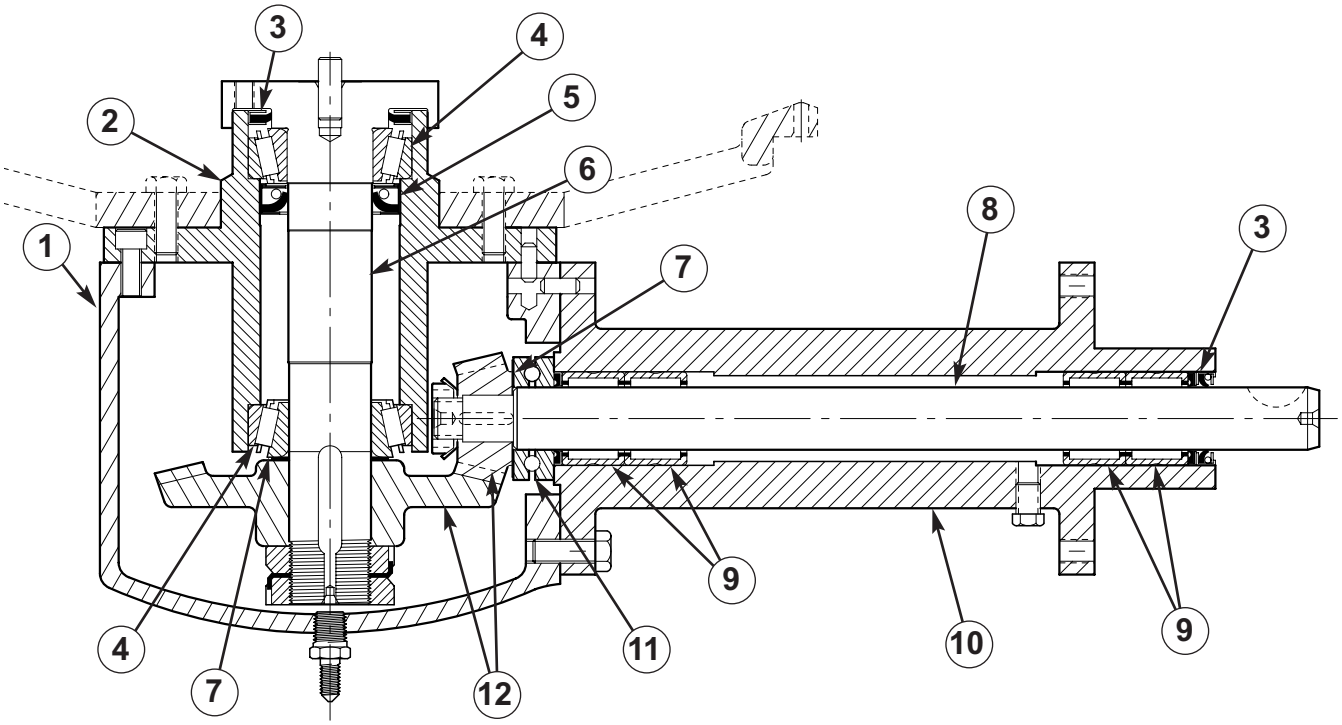


Figure 36 — Impeller drive assembly. (1) Gear Case, (2) Impeller Bearing Housing, (3) Seal, (4) Roller Bearing, (5) Oil Seal, (6) Impeller Shaft, (7) Shims, (8) Drive Shaft, (9) Roller Bearing, (10) Horizontal Bearing Housing, (11) Thrust Bearing, (12) Spiral Bevel Gears

NOTE: *A simple wooden fixture as shown in Figure 37 will aid in positioning the unit for maintenance.*

1. **Remove impeller drive assembly from machine.** See ‘‘Removal’’, page 51.

2. **Remove horizontal bearing housing.** Remove six fasteners and tap flange with a wooden or plastic hammer to loosen. Hold shaft while removing bearing housing. Do not let shaft slip from housing.

3. **Remove impeller bearing housing.** Remove eight socket head screws from bearing housing and drain plug from gear case; insert a brass rod into drain hole and tap bearing housing from gear case (Figure 37).

   NOTE: *Do not pry housing from gear case. Prying may crack the case or damage the flange seat.*

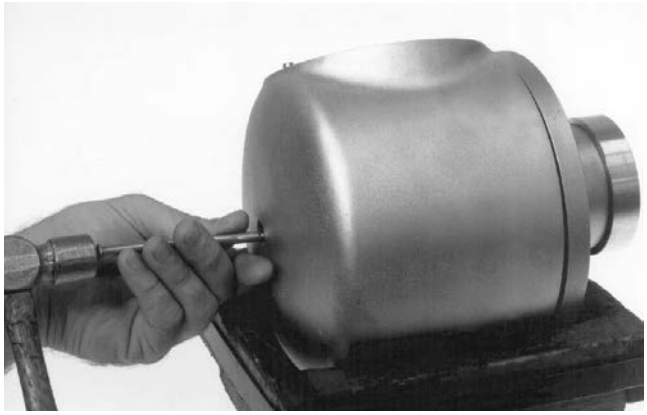


Figure 37 — Removing impeller bearing housing

Steps 4 through 8 refer to impeller bearing housing.

4. **Remove nuts, lock washer, gear, key and shims** from impeller shaft.

5. **Press impeller shaft out from gear end.** Gear end bearing, impeller end seal and bearing cup will remain in housing. Impeller end bearing cone and seal will come out with impeller shaft.

6. **Remove bearing from gear end of housing.** Remove bearing cone. Knock out bearing cup by gently tapping from opposite end of housing with a brass rod. Tap around cup carefully until it drops out.

7. **Remove oil seal and bearing cup from impeller end of housing.** Tap or push oil seal and cup out from opposite end of housing.

8. **Remove bearing cone and seal from impeller shaft.** Use a bearing puller or a wheel puller with a bearing puller attachment to remove cone. Remove seal from shaft.

Steps 9, 10 and 11 refer to the horizontal bearing housing.

9. **Remove shaft with gear, shims and ball thrust bearing.**

10. **Remove the nut, lockwasher, gear and key from the shaft.**

11. **Remove roller bearings.** Use bearing pusher with a rod inserted through housing to push bearings out.

INSPECTION

All parts should be cleaned, inspected for serviceability, and repaired or replaced if necessary.

Bevel and pinion gears: Check for wear, rust, and pitting. Check teeth for chips, breaks and excessive taper or radius on edges. Check fit on shafts. Gears must slip on freely with no excessive clearance. Gears are a matched set; if one is damaged they both must be replaced.

Shafts: Check drive shaft in the bearing areas for wear or scoring. Check impeller shaft for grooves in the top oil seal area; check flange for damage that may affect impeller seat. Check both shafts for nicks or burrs. Hone if necessary. Check keys for proper fit in shaft keyways.

Bearings, seals and shims: Replace whenever drive assembly is rebuilt. Reuse is not recommended.

Gear case and bearing housings: Check mounting surfaces for nicks or burrs. Hone if necessary.

REASSEMBLY

Steps 1 through 13 refer to the impeller bearing housing.

1. **Press oil seal into impeller bearing housing** (impeller end), lip up (spring inside seal facing up).

2. **Press bearing cups into each end of impeller bearing housing and seat securely.** Align high points on bearing cups (small burnish mark on lip of cup) with a pencil mark on housing (Figure 38).

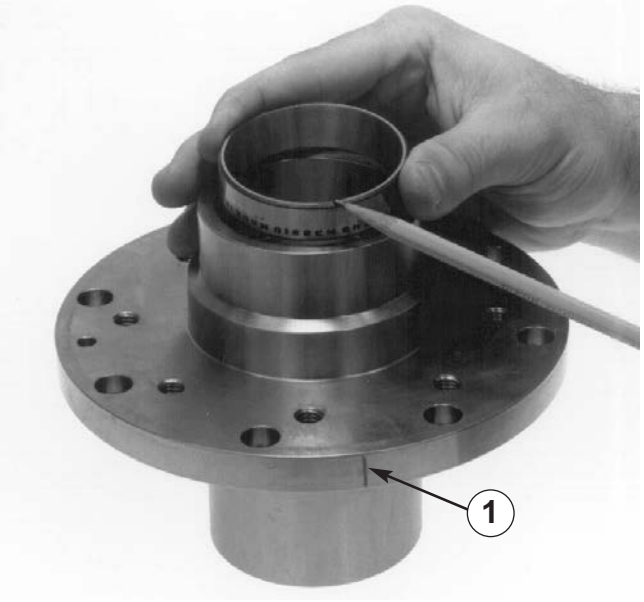


Figure 38 — Align high point on bearing cup with pencil mark on housing. (1) Pencil Mark

3. **Pack upper end of bearing housing and bearing cone with grease** (Chevron FM grease no. 2) and set bearing cone into cup. Rotate bearing to distribute grease and align high point with pencil mark. Do not rotate bearing again until shaft and both bearings have been completely installed. Add grease above bearing.

4. **Press in seal flush with top of bearing housing** (lip up). Fill seal cavity with grease.

5. **Install impeller shaft.** To protect seals, wrap threads on shaft with tape and apply grease. Carefully install shaft and press into housing. Distance from top of impeller shaft flange to top of bearing housing flange is 2-11/32" (59.531 mm).

6. **Turn housing over and place bearing cone on shaft.** Lightly grease cone, align high point with pencil mark and press onto shaft and into bearing housing.

7. **Check fit of key into keyway.** File key if necessary.

8. **Procedure to set bearing preload:** Install gear and key onto shaft. Hone bottom of nut to remove any burrs. Install nut on shaft and tighten securely with spanner wrench. Next, loosen nut by backing off approximately 1/2 turn. Release pressure on bearings by supporting bearing housing on arbor press and pressing on threaded end of shaft (do not damage end of shaft). Nut should not turn with fingers and shaft should now rotate freely. Place magnetic indicator base on gear with indicator on bearing housing flange. Take an indicator reading of end play movement by holding gear and moving bearing housing up and down (Figure 39). Place lock washer on shaft over nut and tighten nut one tang on lock washer. Recheck end play; if any end play is detected, tighten nut one more tang. Repeat this procedure until there is no end play, then tighten an additional 1/2 tang. With correct adjustment, there will be no indicator movement and bearing housing will turn freely with slight drag.

Figure 39 — Using magnetic base indicator to take end play reading.

("Reassembly", continued on page 58)

(“Reassembly”, continued from page 57)

9. **Procedure to set gear backlash:** First check mounting distance. Mounting distance is measured from bottom of gear to bottom of flange on bearing housing and must be 2.500" (63.5 mm) plus mounting distance dimension marked on edge of large gear (Figure 40). With housing upside down, back off nut, position parallels on gear and retighten lock nut. Nut should be snug, but shaft must turn freely. Measure with a 4–5" depth micrometer (Figure 41). Compare the distance measured with the distance obtained by adding 2.500" (63.5 mm) plus dimension etched on large gear, plus thickness of parallels (.500"). Shims are of different thickness and must be selected and placed between gear and tapered roller bearing to give the required distance. Recheck dimension after adding shims.

   NOTE: *All shims in a set may or may not be used. It is recommended that several packs of shims be kept on hand to allow the selection of a variety of shim thicknesses to achieve correct mounting distance.*

10. **Remove parallels.** Retighten lock nut until nut is snug and shaft turns freely with slight drag.

11. **Install lock washer and second lock nut.** Bend tabs on lock washer up and down into lock nuts.

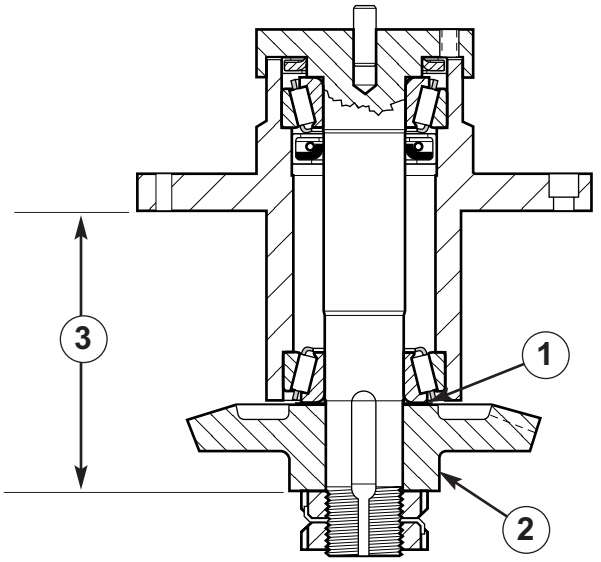


Figure 40 — Check mounting distance and add shims so that distance measured with micrometer equals mounting distance. (1) Shims, (2) Large Gear, (3) 2.500" (63.5 mm) plus dimension etched on large gear

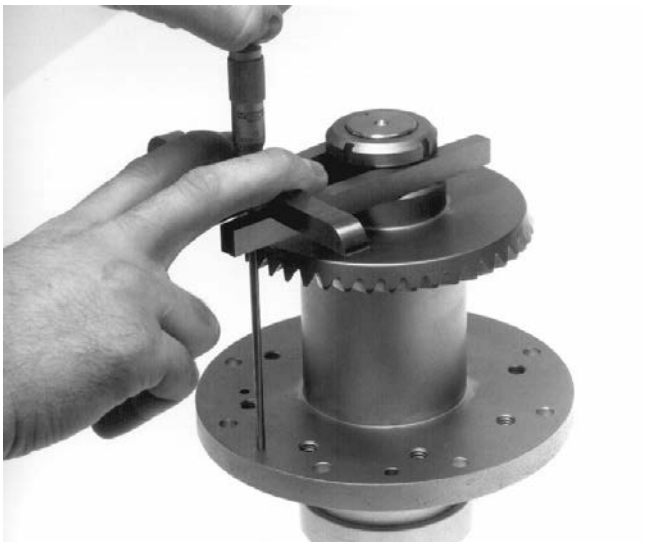


Figure 41 — Using parallels and depth micrometer to measure mounting distance

12. **Install oil drain plug** in bottom of gear case. Use a small amount of Permatex sealant to seal threads.

13. **Fasten impeller bearing housing assembly to gear case.** Use Permatex sealant on face of gear case and fasteners.

Different impeller drive assemblies are available, either with roller bearings or with bushings. Steps 14 and 15 below explain the different procedures required for each assembly:

14. **Assembly with Roller Bearings:**
Press roller bearings into bearing housing, two bearings for each housing end. Recess bearings .458" (11.633 mm) on pulley end and .135" (3.429 mm) on gear end.
Assembly with Bushings:
Press bronze bushings into bearing housing. Make sure open grease grooves face inside. Recess bushing 11/32" (8.731 mm) on pulley end and .005" (.127 mm) on gear end. Check alignment with a new drive shaft. Shaft must slide in and rotate freely.

15. **Assembly with Roller Bearings:**
Press oil seals into bearing housing. On gear end seal lip is facing out. For pulley end lip of thin seal is in, with thicker seal facing out.
Assembly with Bushings:
On pulley end, press oil seal into bearing housing, lip out.

Figure 42 — Using depth micrometer to measure mounting distance for pinion gear

16. **Position thrust bearing** so that washer with larger bore is against bearing housing. Check mounting distance from face of thrust bearing to flange of bearing housing. Use a 0–1" depth micrometer held across the face of thrust bearing (Figure 42). This dimension must be .749 to .750" (19.025 to 19.050 mm). Select proper thickness of shims and place on thrust bearing to obtain this dimension.

17. **Fasten pinion gear to drive shaft** using key, lock washer and lock nut.

18. **Slide shaft with gear** through the shims and thrust bearing and into bearing housing. Grease shaft and bushings before assembly (Haynes Lubrifilm).

19. **Lubricate horizontal bearing housing.** With grease fitting and drain plug in place, slowly fill with grease (Haynes Lubrifilm) until grease is visible at thrust bearing end of housing. Check pulley end of housing to verify that seal is still properly seated.

("Reassembly", continued on page 60)

(“Reassembly”, continued from page 59)

20. **Fasten bearing housing to gear case.** Use Permatex sealant on fasteners and gear case face. The large bevel gear has two “X”s on adjacent teeth and the pinion gear has a single “X” on one tooth. “X” tooth on pinion gear must be placed between two “X”s on bevel gear. Coloring the outside edges of the “X” teeth with a marker will make them easier to see. Extend shaft in horizontal bearing housing a sufficient distance so as to see gears in housing as they are placed together (Figure 43). Carefully position housing on gear case, making certain drain plug is at the bottom of housing. Replace fasteners and tighten. Lifting up slightly on drive shaft while tightening bearing housing will prevent binding of gears. Check drive shaft end movement (Figure 44). In-and-out movement should not be less than .008" (.203 mm) nor more than .025" (.635 mm). Both shafts should turn easily with no tight areas or binding.

Impeller drive assembly is now ready for installation in machine. See ‘‘Installation’’, page 52.

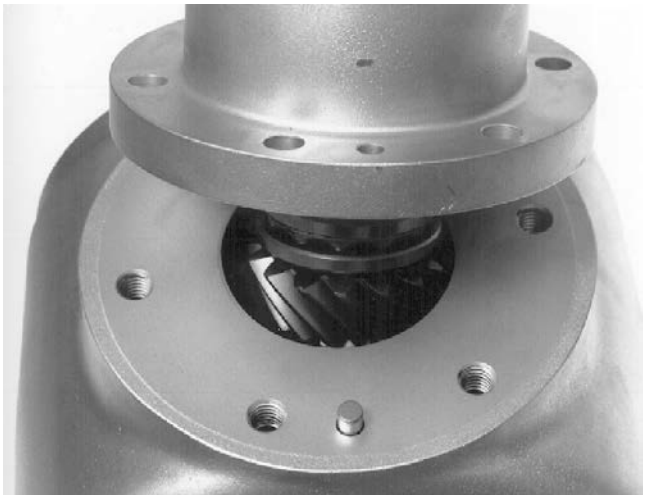


Figure 43 — Installing horizontal bearing housing - mesh bevel and pinion gear teeth

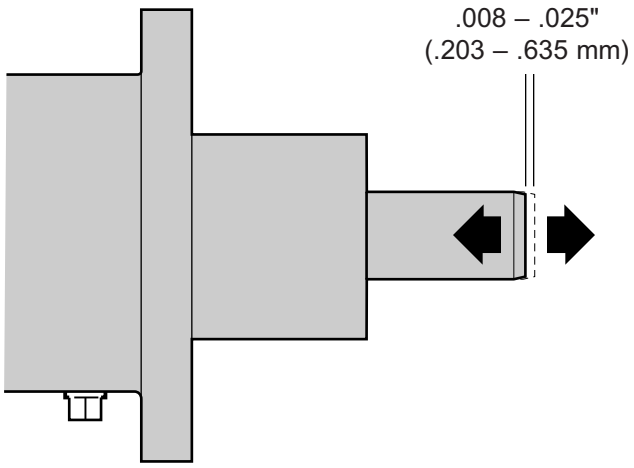


Figure 44 — Check drive shaft end movement

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 14–17. Electrical schematics are located in the starter enclosure and on pages 104–105. Refer to Figures 45 & 46. Inspect the following:

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 the gasket around door and window. Inspect **"O"** (STOP) and **"I"** (START) push button assemblies 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.*

("Electrical Assembly", con't. on page 62)

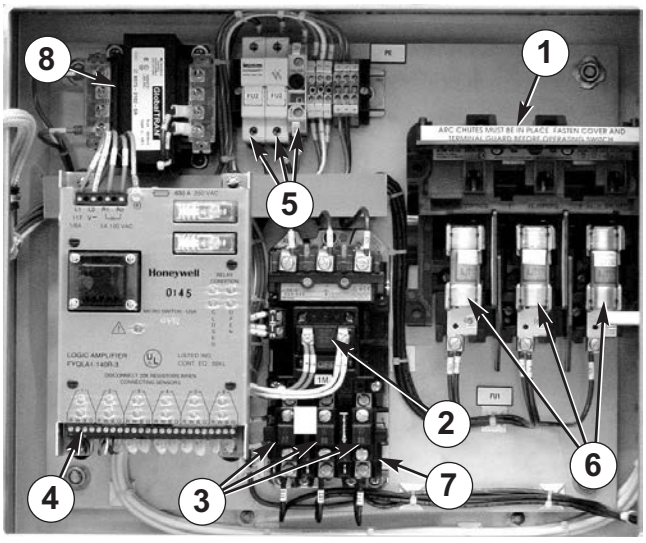


Figure 45 — Typical starter enclosure interior, NEMA. (1) Disconnect, (2) Starter Coil, (3) Heaters, (4) Amplifier, (5) Transformer Fuses, (6) Main Fuses, (7) Overload Relay, (8) Transformer*

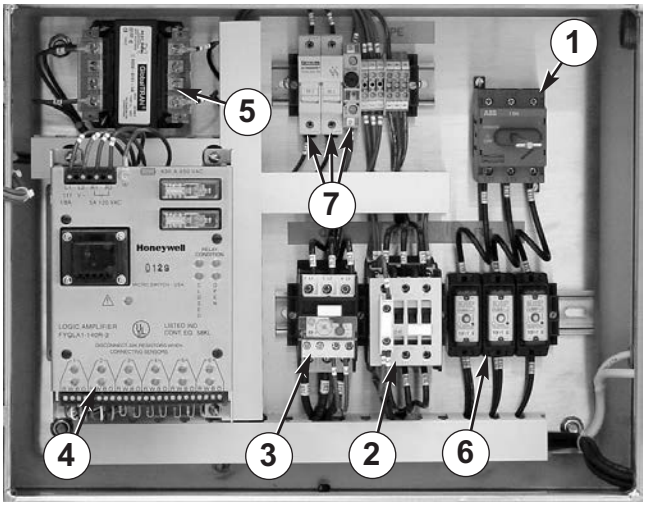


Figure 46 — Typical starter enclosure interior, CE Compliant. (1) Disconnect, (2) Contactor, (3) Overload Relay, (4) Amplifier, (5) Transformer, (6) Main Fuses, (7) Transformer Fuses

**National Electrical Manufacturers Association*

("Electrical Assembly", con't. from page 61)

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.

Overload relay (NEMA & CE enclosures): If overload relay has been tripped several times, it may fail to reset and must be replaced. Check for proper motor current draw if overload relay continues to trip.

Safety switches: Terminals should be tight and free from corrosion. Recommended torque is 5 inch pounds or 0.56 newton-meters. Check sensors, actuators and cords for damage. *Switches should be replaced if any defect or damage is detected.* Check switch alignment. Actuator must be aligned and within 1/16" (1.6 mm) of sensor to complete safety switch circuit (Figure 47).

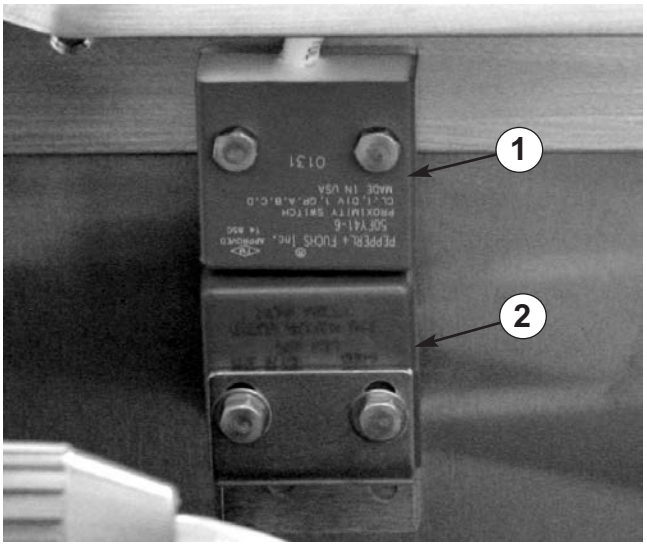


Figure 47 — Safety switch sensors and actuators must be aligned and within 1/16" (1.6 mm).
(1) Sensor, (2) Actuator

Amplifier: The amplifier and safety switches incorporate self-diagnostic features to help identify the source of problems. The LEDs on the amplifier (Figure 48, next page) will indicate the status of the system:

⚠ WARNING: ***The amplifier must be properly wired to function correctly. If an amplifier or sensor is replaced, consult the manufacturer's literature for complete wiring instructions.***

Both green "relay condition" LEDs are illuminated: all circuits are closed and machine is ready for operation.

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 48) 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 62). If red “switch output” LEDs which correspond to a resistor are illuminated, disconnect and lock out the power source, verify the resistance value of the resistor and check the connection for tightness (5 inch pounds or 0.56 newton-meters). Turn power disconnect/lockout switch to “I” (ON). If LEDs remain lit, contact Urschel Laboratories.

Both red “relay condition” LEDs are illuminated and the red “attention” LED is flashing: the amplifier has detected a fault. To reset the system, turn the power disconnect/lockout switch to “O” (OFF) and lock out power source. Perform safety switch inspection (see “Safety switches”, page 62). Turn power disconnect/lockout switch to “I” (ON). If problem persists, contact Urschel Laboratories.

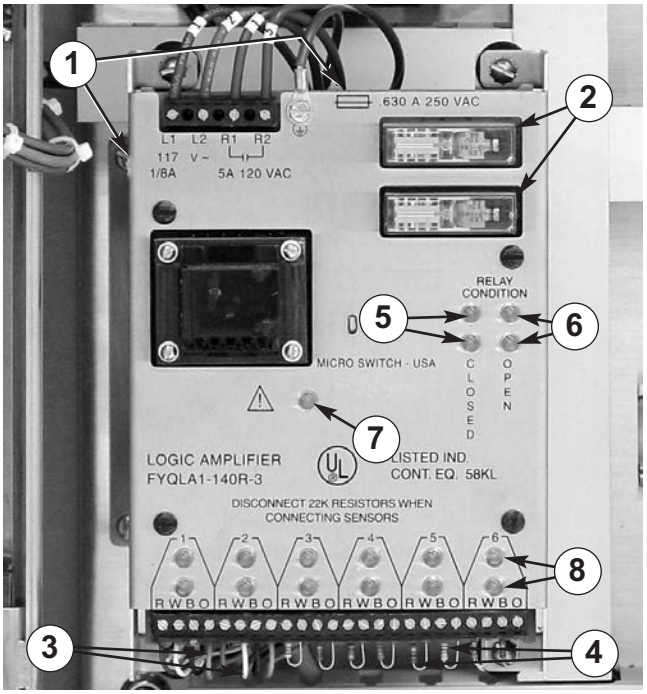


Figure 48 — Amplifier. (1) Fuses, (2) Relays, (3) Sensor Leads, (4) Resistors, (5) Green “Relay Condition” LEDs, (6) Red “Relay Condition” LEDs, (7) Red “Attention” LED, (8) Red “Switch Output” LEDs

⚠ **WARNING:** ***A qualified trained person must always perform the safety switch system test before operating the machine. See “Safety Switch System Test”, page 16.***

(“Electrical Assembly”, con’t. on page 64)

See the addendum for updated information

(“Electrical Assembly”, con’t. from page 63)

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 49).

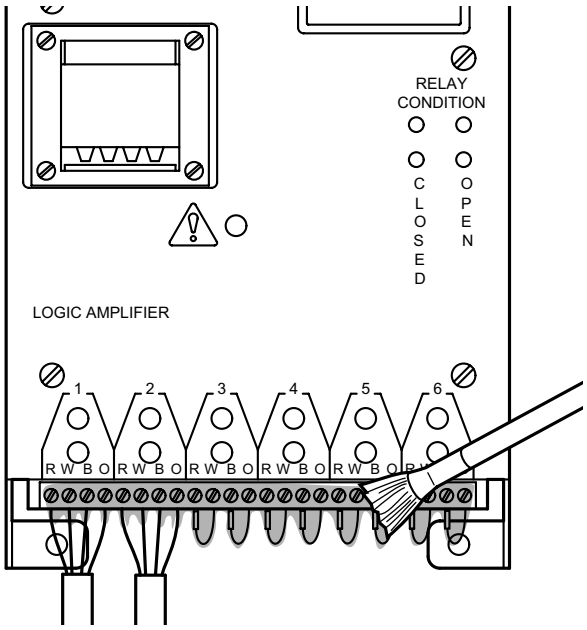


Figure 49 — For moisture protection, generously coat resistors, sensor leads, screw terminal holes and terminal strip area with dielectric tune-up grease.

PROBLEM	CAUSE	CORRECTION
Unsatisfactory Cuts or Excessive Scrap	Dull knives	Replace as required. See “Inspection”, page 44.
	Damaged knife holders	Replace as required. See “Inspection”, page 45.
	Improper slice adjustment	Set slice thickness setting gauge with setting block and adjust shred thickness. See “Adjustments”, pages 48–49.
	Knife not seated properly	Check knives to see if they are properly seated in clean knife holders and shoes. See “Reassembly”, page 46.
	Product build up on contact parts	Clean cutting unit and maintain regular cleaning schedule. See “Cleaning”, pages 38–39.
	Enlarged holes in cutting head support	Replace cutting head support or return to factory for repair. See “Inspection”, page 43.
	Worn impeller paddles	Replace impeller. See “Inspection”, page 43.
	Worn impeller drive assembly	Replace impeller shaft bearings. See “Inspection”, page 51.
	Worn shoes	Shoes with loose pins and/or worn inner surfaces should be replaced. See “Inspection”, page 45.
	Incorrect spacer between shred shoes and top support ring	Use correct shred shoe spacer. See “Cutting Heads”, pages 82–87.

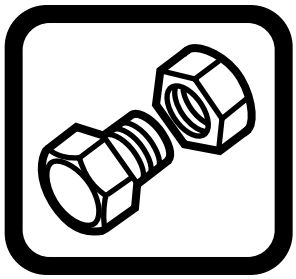
PROBLEM	CAUSE	CORRECTION
Harsh, Metallic Grinding Sound	Impeller rubbing against shoes or knives	Check for and remove any product between impeller and impeller shaft. Inspect for over-size holes in cutting head support. See ‘‘Inspection’’, page 43. Check for worn impeller drive assembly. See ‘‘Inspection’’, page 51.
	Timing pulley rubbing against horizontal bearing housing	Set proper clearance. See “Adjustments”, page 53.
	Impeller screws rubbing against gear case or seals	Use correct impeller mounting screws; see pages 78–79.
	Worn motor bearings	Run motor with belts removed to verify. Contact Urschel Laboratories for location of nearest authorized motor service center.
Slow, Sluggish Operation	Timing belt slipping	Make sure belt is clean and pulleys are aligned. Replace worn or frayed belt and adjust belt tension. Check for worn pulley teeth and replace if necessary.
	Lack of lubrication or improper lubricant	See “Lubrication”, pages 40–41.
	Loss of one phase of power	Perform complete electrical check on motor starter. See “Electrical Schematic”, pages 104–105 or inside starter enclosure.
	Motor problem	Contact Urschel Laboratories for location of nearest authorized motor service center.

PROBLEM	CAUSE	CORRECTION
Difficulty in Adjusting Product Thickness	Failure to loosen the hex head screws that hold shoes to top support ring	See “Adjustments”, pages 48–49.
	Overtightening the screws that hold shoes to top support ring causing indentation of washer into top support ring	Replace top support ring. See “Adjustments”, pages 48–49.
	Rotating cutting head clockwise while making thickness adjustment	Rotate cutting head counterclockwise while making adjustments. See “Adjustments”, pages 48–49.
	Dirt or product build-up between shoes and top support ring	Remove shoes from top support ring; clean and hone all mating surfaces flat. See “Disassembly”, page 44.
	Incorrect spacer between shred shoes and top support ring	Use correct shred shoe spacer. See “Cutting Heads”, pages 82–87.
Machine Does Not Start	Power disconnect/lockout switch is in the “O” (OFF) position	Turn power disconnect/lockout switch to the “I” (ON) position, page 32.
	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 36.
	Overload relay tripped	Wait 5 minutes. Press “RESET” button. See “Motor Overload”, page 34.
	Amplifier malfunction	Check amplifier. See “Amplifier”, pages 62–63 or “Electrical Schematic”, pages 104–105.
	Blown fuses	Check main, transformer and amplifier fuses. See “Inspection”, pages 61–63.
	Electrical system malfunction	Inspect electrical system. See “Inspection”, pages 61–64.

MAINTENANCE

Troubleshooting

PROBLEM	CAUSE	CORRECTION
Motor Frequently Becomes Overloaded	Machine overload or jam	See “Machine Overload or Jam”, page 34.
	Dull knives	Replace as required. See “Inspection”, page 44.
	Feed rate too high	See “Feeding Method”, page 33.
	Power source too low	Maintain incoming power to at least 95% of specified voltage.
	Motor problem	Contact Urschel Laboratories for location of nearest authorized motor service center.



PARTS

This page intentionally left blank.

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.

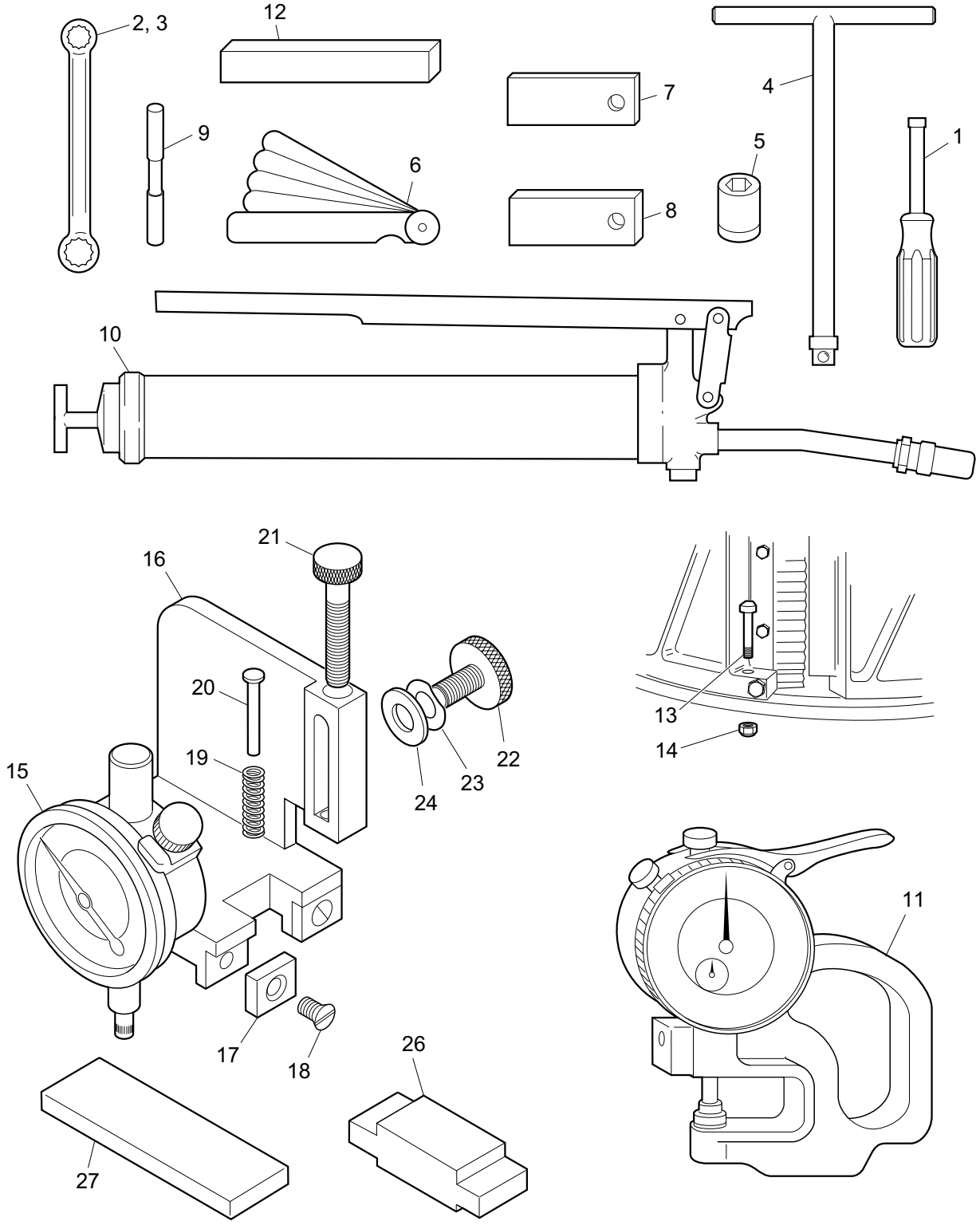
RETURNING PARTS FOR REPAIR

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 instructions.
3. Include name and phone number of person to contact if further information is required by repair department.

Customers in U.S.A.: It is not necessary to inform Urschel Laboratories, Inc. by phone that you are returning parts for repair as long as complete instructions are included in the package.

Customers Outside U.S.A.: Contact your nearest Urschel representative. If repair services are not available from your representative, you may wish to inquire by fax or e-mail about shipping and related expenses to determine if repair at the Valparaiso factory is cost effective. The country code for dialing the U.S.A. is 1.

URSCHEL
CORPORATE HEADQUARTERS
1200 Cutting Edge Drive
Chesterton, Indiana 46304 U.S.A.
Corporate: +1.219.464.4811 Fax: +1.219.462.3879
Toll Free: +1.844.URSCHEL (877.2435)
www.urschel.com
Technical Publication inquiries: techpubs@urschel.com
Other inquiries: info@urschel.com


2, 3
12
7
4
9
6
5
1
8
10
21
16
20
19
15
22
23
24
13
14
11
17
18
26
27

ITEM NO.	PART NO.	DESCRIPTION	QTY.
1	11002	**Nut Driver,** *5/16"*	1
2	11029	**Wrench,** *box end, 1/2 x 9/16"*	1
3	11047	**Wrench,** *box end, 7/16"*	1
4	17389	**"T" Wrench**	1
5	11032	**Socket,** *7/16"*	1
6	11042	**Feeler Gauge**	1
7	22834	**Dowel Pin Gauge Block,** *.125"*	1
8	22835	**Dowel Pin Gauge Block,** *.250"*	1
9	22973	**Pin Gauge**	1
10	11070	**Grease Gun**	1
11	22795	**Slice Thickness Gauge,** *flat slice*	1
	22939	**Slice Thickness Gauge,** *flat slice, metric*	1
12	22149	**Block for Clamping Knives,** *(shredding heads only)*	1
13	22535	**Hold Down Screw,** *(for cutting head assemblies to help keep shoe stable, especially with hard product)*	2
14	10230	**Hex Nut,** *1/4-20, s.s., locking, thick , (for cutting head assemblies)*	2
—	22232	† **Slice Thickness Setting Gauge,** *(includes items 1-11)*	1
15	22231	‡ **Dial Indicator**	1
16	22496	**Base,** *thickness setting gauge, (includes items 3 & 4)*	1
17	22730	**Carbide Insert**	2
18	10333	**Flat Head Machine Screw,** *5-40 x 1/4", s.s.*	2
19	22254	**Spring for 22232 Gauge**	1
20	10332	**Rivet,** *flat head, 1/8 x 7/8"*	1
21	22235	**Adjusting Screw**	1
22	22234	**Locking Screw**	1
23	22252	**Spring Washer,** *shake proof*	1
24	10007	**Washer,** *flat, 1/4", s.s., thin*	1
25	22236	**Case For Gauge,** *(not shown)*	1
26	§	**Setting Block**	1
27	22133	**Adapter Block For Gauge,** *.150" thick*	1
—	11045	**Grease Cartridge,** *Haynes® Lubri-Film, USDA Class H1 lubricant, (not shown)*	2
—	22565	* **Oil, 5 gallons,** *(not shown)*	1
—	11071	**Tool Box,** (*not shown)*	1
OPTIONAL TOOLS			
—	22447	**Bearing Pusher,** *(not shown)*	1
—	11069	**Grease Cartridge,** *Chevron FM® Grease No. 2, (not shown)*	1
—	22789	**Blank Anvil,** *for slice thickness gauge, flat slice, (not shown)*	1

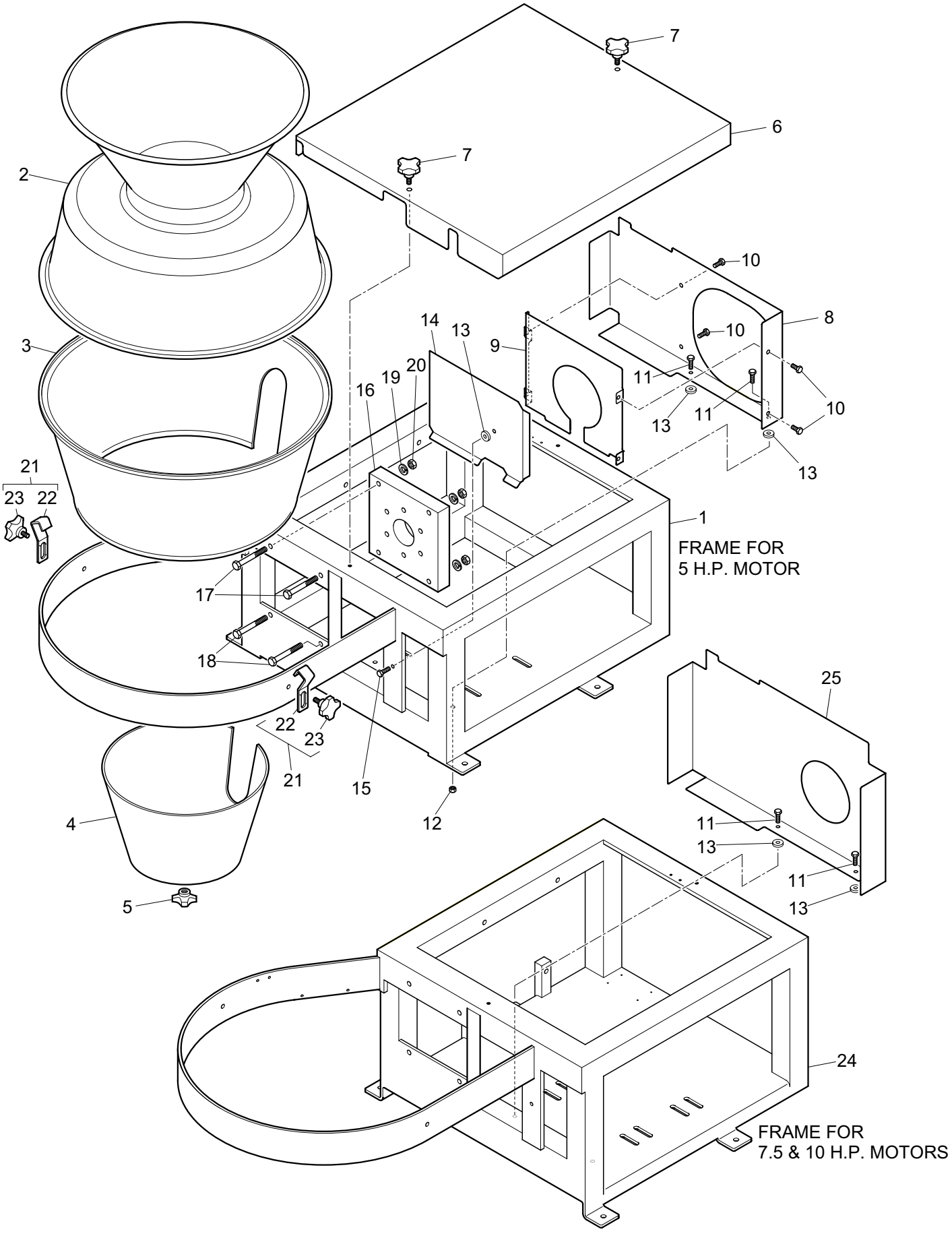
* Cannot be shipped via air or ocean freight.
† For metric order part number 22652.
‡ For metric order part number 22534.
§ See chart below. One setting block supplied with machine.

ITEM 12 SETTING BLOCK (ENGLISH)		
PART NO.	**SIZES (in inches)**	**TYPE OF CUT**
22276	.040 .050 .060 .070"	Flat Slice
22165	.080 .090 .100 .110"	Flat Slice
22918	Std. -.020 -.040 -.060	Oval Shred, Full Shred, .125
23187	Std. -.020 -.040 -.060	Wide Oval Shred
22917	Std. -.010 -.020 -.030	Full Shred, .070
23151	Std. -.010 -.020 -.030	Full Shred, .097

PARTS

Frame, Covers and Guards

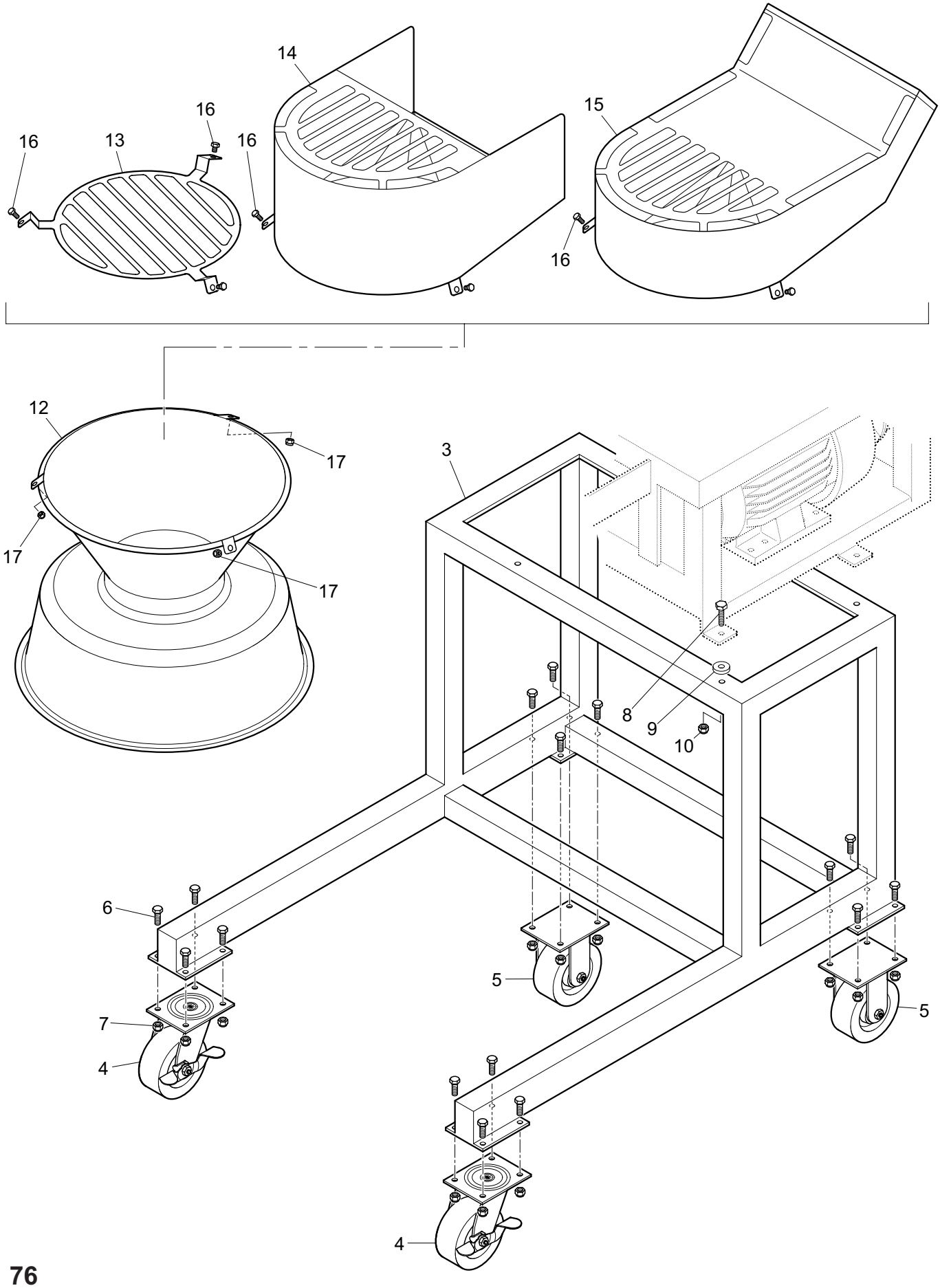
See the addendum for updated information



ITEM NO.	PART NO.	DESCRIPTION	QTY.
5 H.P. MACHINE			
1	23090	**Frame,** *CC-D*	1
2	22913	**Feed Hopper Assembly,** *CC-D*	1
3	22903	**Lower Discharge Chute,** *CC-D*	1
4	22904	**Impeller Drive Shield,** *CC-D*	1
5	63825	**Hand Knob,** *5/16-18 thread*	1
6	23091	**Frame Cover**	1
7	22906	**Hand Knob w/Stud,** *5/16-18*	2
8	23088	**Belt Guard,** *inner*	1
9	23089	**Belt Guard,** *insert*	1
10	10251	**Hex Head Cap Screw,** *1/4-20 x 1/2", s.s., Nylok®*	4
11	10336	**Hex Head Cap Screw,** *1/4-20 x 7/8", s.s.*	2
12	10230	**Hex Nut,** *1/4-20, s.s., locking, thick*	2
13	22934	**Spacer,** *.19" thick, nylon, CC-D*	3
14	22932	**Belt Guard,** *CC-D*	1
15	10038	**Hex Head Cap Screw,** *1/4-20 x 3/4", s.s.*	1
16	22013	**Support Plate**	1
17	10063	**Hex Head Cap Screw,** *3/8-16 x 2-1/4", s.s.*	2
18	10062	**Hex Head Cap Screw,** *3/8-16 x 2", s.s.*	2
19	10015	**Lock Washer,** *3/8", s.s.*	4
20	10022	**Hex Nut,** *3/8-16", s.s.*	4
21	22979	**Feed Hopper Clamp Assembly,** *CC-D, (includes items 22–23)*	1
22	22978	**Feed Hopper Clamp,** *CC-D*	2
23	22906	**Hand Knob w/Stud,** *5/16-18*	2
FOR 7.5 & 10 H.P. MACHINES, REPLACE IEMS 1, 8 & 9 WITH THE FOLLOWING:			
24	23252	**Frame,** *CC-D, 7.5–10 H.P.*	1
25	23253*	**Belt Guard,** *inner, 7.5–10 H.P.*	1

* Some machines where built using a belt guard insert (part number 23254), similar to item 9 above. The inner belt guard (part number 23253) also had a larger opening for the motor shaft. The current design as shown does not require the insert.

See the addendum for updated information



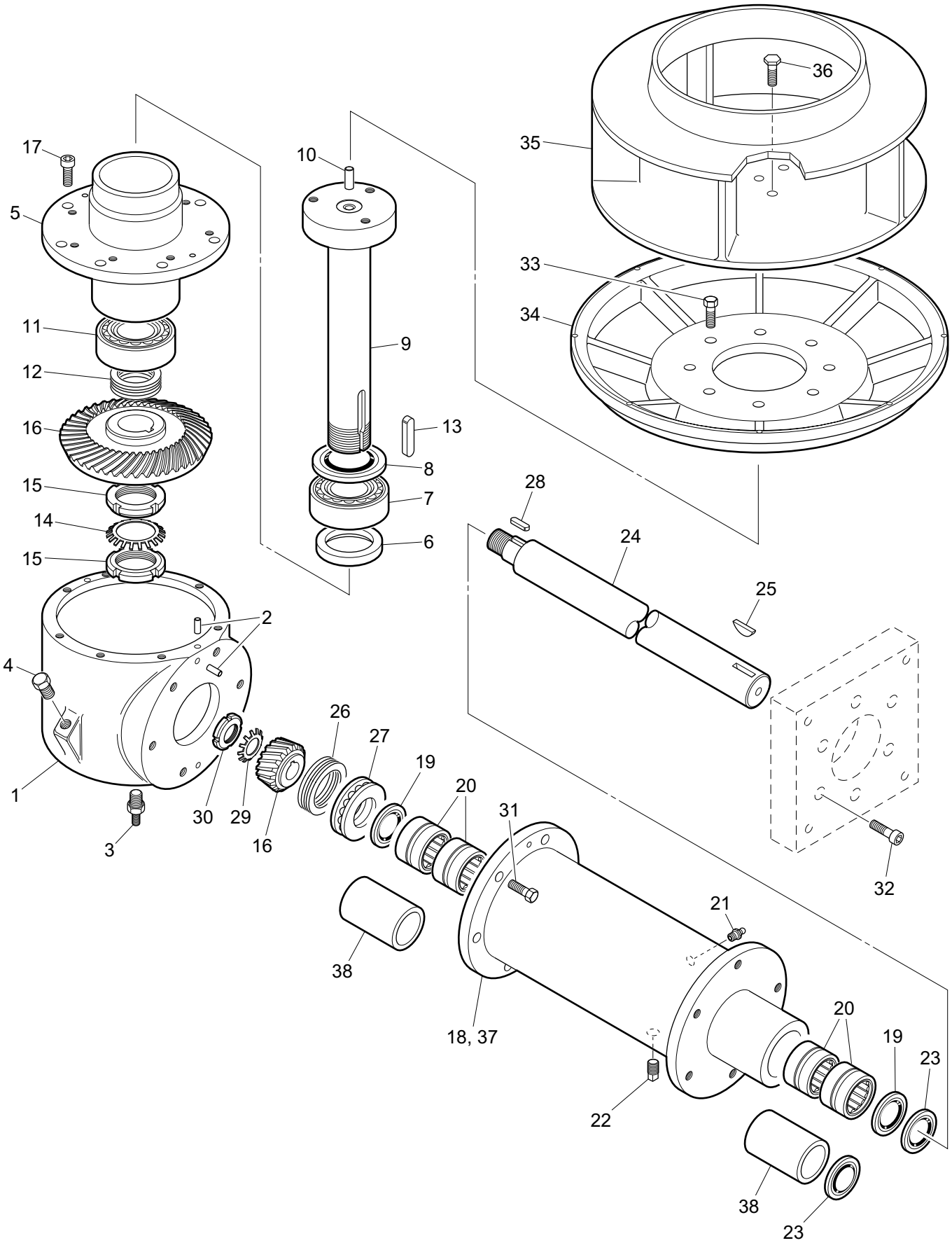
ITEM NO.	PART NO.	DESCRIPTION	QTY.
1	22470	**Floor Stand,** *27.19" (690.63 mm) discharge height, casters*	1
	22509	**Floor Stand,** *30.44" (773.18 mm) discharge height, casters*	1
	22569	**Floor Stand,** *33.44" (849.38 mm) discharge height, casters*	1
	22461*	**Floor Stand,** *36.44" (925.58 mm) discharge height, casters*	1
	22510*	**Floor Stand,** *39.44" (1001.80 mm) discharge height, casters*	1
	22533	**Floor Stand,** *42.44" (1078.00 mm) discharge height, casters*	1
—	12384	**Plate Caster Assembly,** *set of four with fasteners, (includes items 4–7)*	1
4	12477	**Swivel Caster,** *plate type*	2
5	12528	**Rigid Caster,** *plate type*	2
6	10058	**Hex Head Cap Screw,** *3/8-16 x 1", s.s.*	16
7	10249	**Hex Nut,** *3/8-16, s.s., locking, thick*	16
8	10059	**Hex Head Cap Screw,** *3/8-16 x 1-1/4", s.s.*	4
9	22957	**Spacer,** *.25" thick, nylon*	4
10	10249	**Hex Nut,** *3/8-16, s.s., locking, thick.*	4
11	10060	**Hex Head Cap Screw,** *3/8-16 x 1-1/2", s.s.*	2
12	23110	**Feed Hopper Assembly,** *with tabs, CC-D (replaces item 2, page 75)*	1
13	22963	**Funnel Hopper Grid**	1
14	22965	**Funnel Hopper Extension,** *conveyor feed*	1
15	22967	**Funnel Hopper Extension,** *hand feed*	1
16	10257	**Hex Head Cap Screw,** *1/4-20 x 5/8", s.s.*	3
17	10230	**Hex Nut,** *1/4-20, s.s., locking, thick*	3

* These floor stands have two through holes and two tapped holes for mounting the machine to the stand; two 10059 cap screws (item 8), two 10249 hex nuts (item 10) and two 10060 cap screws (item 11) are required.

PARTS

Impeller Drive Assembly (Stainless Steel)

See the addendum for updated information

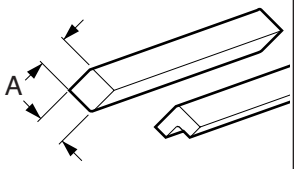
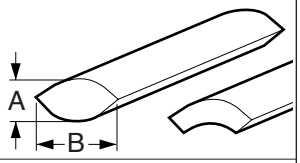
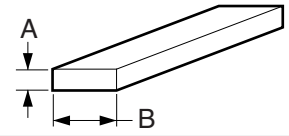


ITEM NO.	PART NO.	DESCRIPTION	QTY.
—	22977	***Impeller Drive Assembly**, s.s., roller bearing, CC-D, (includes items 1-31)*	1
1	22554	**Gear Case,** *s.s., (includes item 2)*	1
2	37040	**Dowel,** *1/4" x 5/8" long*	4
3	22905	**Drain Plug,** *CC-D*	1
4	22084	**Pipe Plug,** *1/4", s.s.*	1
5	22552	**Impeller Bearing Housing,** *s.s.*	1
6	22036	**Oil Seal**	1
7	22037	**Roller Bearing**	1
8	22044	**Seal**	1
9	22054	**Shaft,** *impeller, (includes item 10)*	1
10	22081	**Dowel,** *3/8" x 31/32" long*	1
11	22038	**Roller Bearing**	1
12	22032	****Shims,** *(set of 5), 1.322" I.D.*	1
13	22035	**Key**	1
14	22048	**Lock Washer**	1
15	22047	**Lock Nut**	2
16	22046	**Spiral Bevel Gear,** *pair*	1
17	10100	**Socket Head Cap Screw,** *5/16-18 x 3/4", s.s.*	8
18	22976	**Bearing Housing,** *s.s.*	1
19	22058	**Seal**	2
20	22399	**Roller Bearing**	4
21	11401	**Grease Fitting,** *1/8", straight, s.s.*	1
22	22564	**Pipe Plug,** *1/8", s.s.*	1
23	22045	**Seal**	1
24	22053	**Shaft,** *drive, (includes item 25)*	1
25	22277	**Key**	1
26	22031	****Shims,** *(set of 5), 1.01" I.D.*	1
27	22043	**Thrust Bearing**	1
28	22034	**Pinion Gear Key**	1
29	22050	**Lock Washer**	1
30	22049	**Lock Nut**	1
31	10058	**Hex Head Cap Screw,** *3/8-16 x 1", s.s.*	6
32	10113	**Socket Head Cap Screw,** *3/8-16 x 1-1/4", s.s.*	6
33	10058	**Hex Head Cap Screw,** *3/8-16 x 1", s.s.*	8
34	22420	**Cutting Head Support,** *s.s.*	1
35	22911	**Impeller,** *5 paddle, 13.960 O.D., s.s., CC-D*	1
36	22938	**Impeller Mounting Screw,** *CC-D*	3
OPTIONAL IMPELLER DRIVE ASSEMBLY WITH BUSHINGS			
—	22916	***Impeller Drive Assembly**, s.s., bushings, CC-D, (includes items 1-17 and 21-31 above and items 37-38 below)*	1
37	22550	**Bearing Housing,** *s.s., (includes item 38)*	1
38	22427	**Bushing,** *1.00" x 1.50" x 2.50"*	2

***** An exchange program is available on this assembly, see page 50.

**** NOTE:** *Several packs of shims should be kept on hand when rebuilding impeller drive assembly. (See "Impeller Drive Assembly", page 54).*

See the addendum for updated information

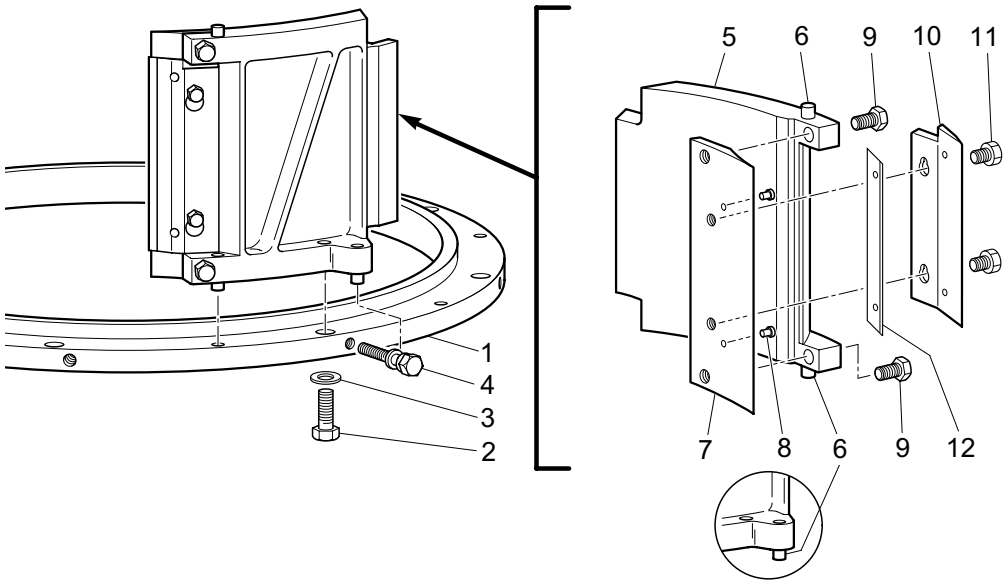
CUTTING HEAD CHART							
TYPE OF CUT	CUTTING HEAD ASSEMBLY		*SIZE OF CUT				
			A		B		
	Part #	Pg. #	inches	mm	inches	mm	
Flat Slice	23174	81	.040-.100	1.02-2.54	—	—	
.070 Full & V Shred	22895	82	.070	1.78	—	—	
.070 Full & V Shred, hard product	22922	83	.070	1.78	—	—	
.097 Full & V Shred	23140	84	.097	2.46	—	—	
.097 Full & V Shred, hard product	23132	85	.097	2.46	—	—	
.125 Full & V Shred	22896	86	.125	3.18	—	—	
Oval & Crescent Shred	22897	87	.125	3.18	.250	6.35	
Wide Oval & Wide Crescent Shred	23190	88	.125	3.18	.375	9.53	
1/4" Strip Cut	23147	89	.040-.100	1.02-2.54	.250	6.35	
3/4" Strip Cut	23148	90	.040-.100	1.02-2.54	.750	19.05	

* Measurement in cross section; full shred is measured along each side; oval shred is thickness by width. See “Sizes and Types of Cut”, pages 23–24. Chart shows dimensions obtained when using standard setting. Settings greater than standard will produce connected shreds. Settings less than standard on full shreds will produce a “V” shred. Settings less than standard on oval shreds will produce a crescent shred.

NOTE: *.125 shred shoes are used to obtain .070 full and V shred cut sizes, .170 shred shoes are used to obtain .097 full and V shred cut sizes, and .212 shred shoes are used to obtain .125 full and V shred cut sizes.*

23174 FLAT SLICE, Stainless Steel Assembly *(use with 13.960" O.D. stainless steel impeller)*

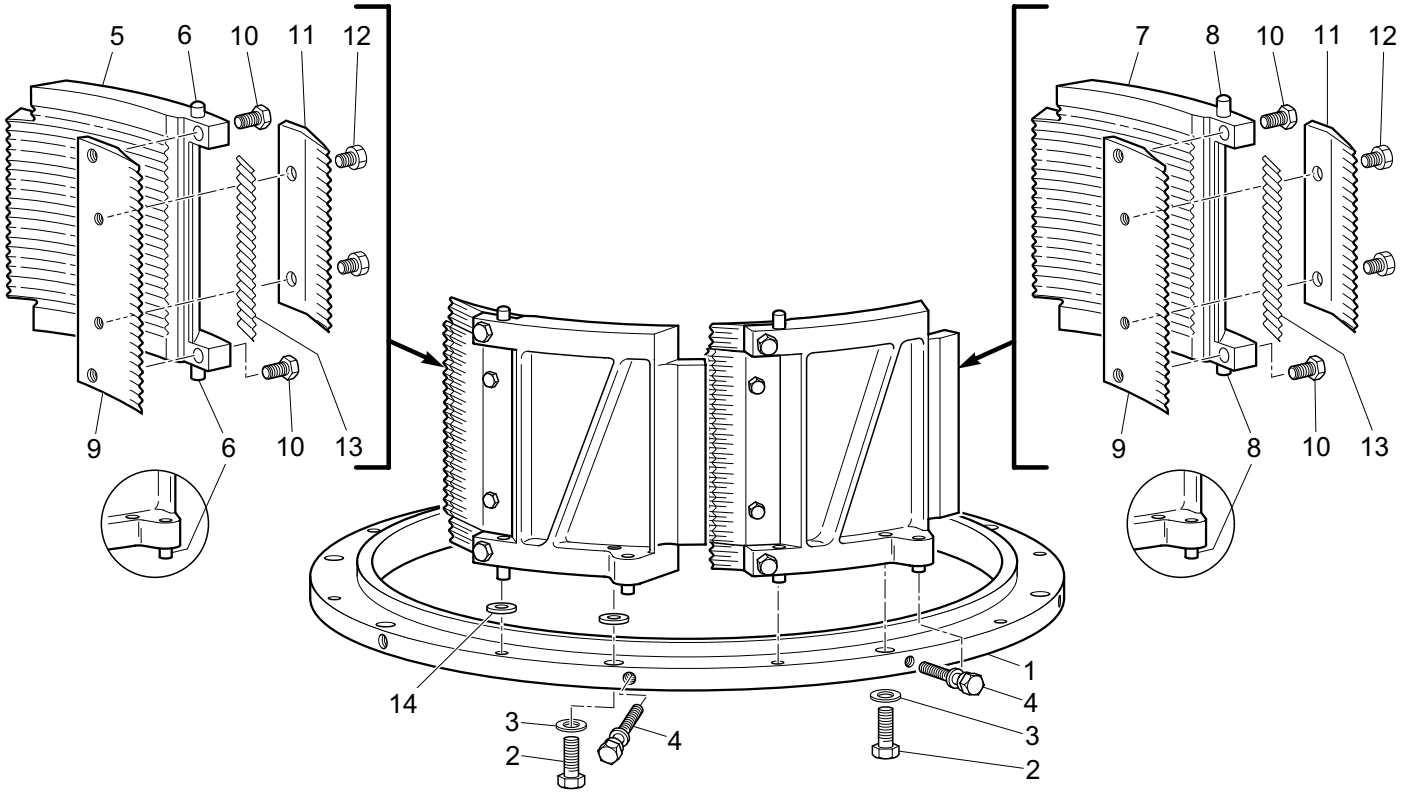
ITEM NO.	PART NO.	DESCRIPTION	QTY.
—	23174	**Head Assembly,** *slice, flat, s.s., CC-D, (includes items 1–13)*	1
1	22899	**Top Support Ring,** *s.s., CC-D*	1
2	10048	**Hex Head Cap Screw,** *5/16-18 x 1-1/4", s.s.*	8
3	22206	**Washer,** *flat, .328 I.D. x .75 O.D. x .125*	8
4	22898	**Adjusting Screw,** *hex, Nylok, CC-D*	8
5	23149	**Shoe,** *slicing, flat, gateless, s.s., (includes item 6)*	8
6	22894	**Dowel Pin,** *1/4 x 15/16", long*	3
7	22181	**Knife Holder,** *flat, (includes item 8)*	8
8	22071	**Locating Pin**	2
9	10038	**Hex Head Cap Screw,** *1/4-20 x 3/4", s.s.*	16
10	22074	**Knife Clamp,** *flat*	8
11	10224	**Hex Head Cap Screw,** *10-24 x 1/4", s.s.*	16
12	22064	**Knife,** *slicing, flat, s.s., (pkg. of 96 knives - use part no. 22294)*	8
13	22146	**Shipping Plate,** *(not shown)*	1
		OPTIONAL KNIVES	
—	22794	**Knife,** *slicing, flat, heavy-duty bevel, gold, for hard-to-cut products, (pkg. of 96 knives - use part no. 22793)*	8
—	22936	**Knife,** *slicing, flat, standard bevel, gold, for hard-to-cut products, (pkg. of 96 knives - use part no. 22937)*	8



See the addendum for updated information

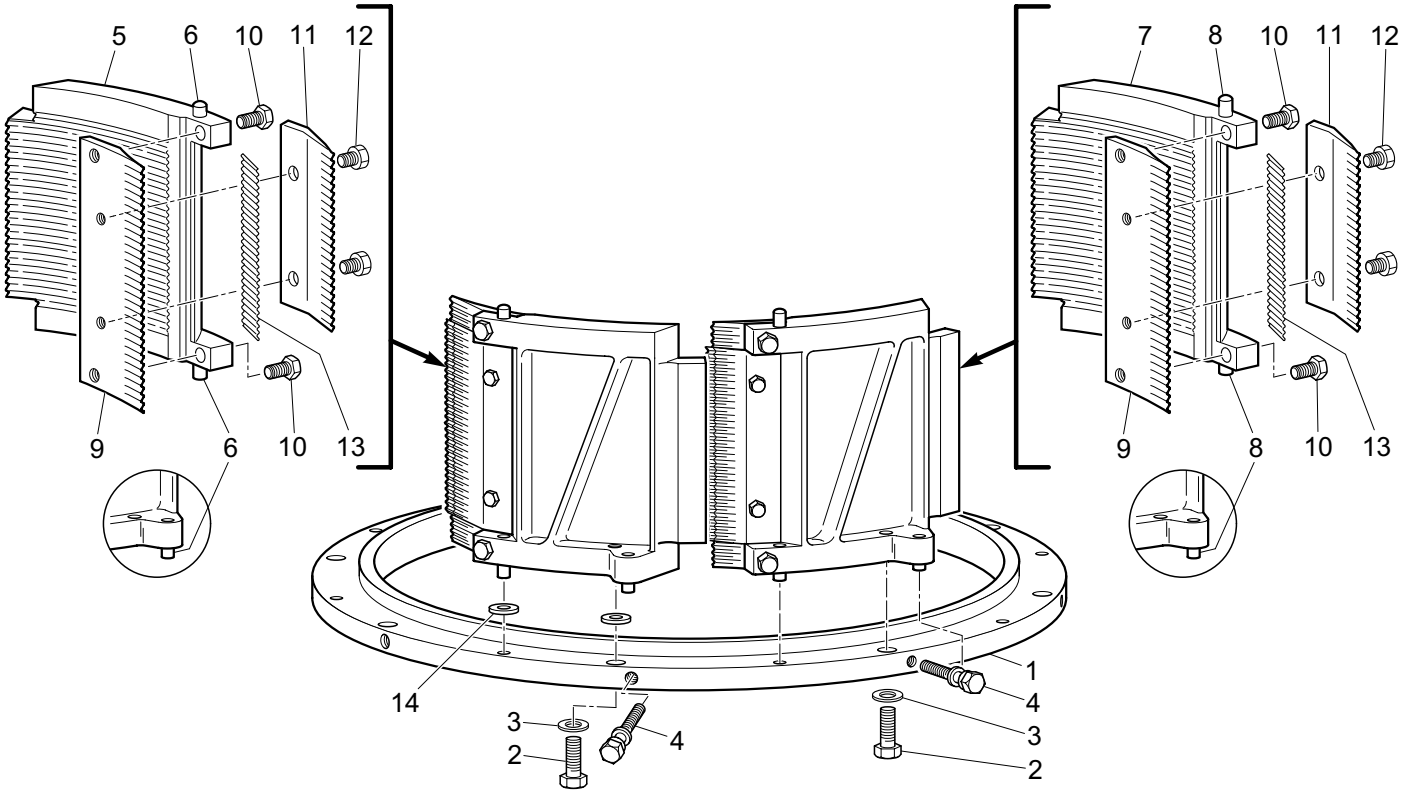
22895 FULL SHRED (.070) & V SHRED, Stainless Steel Assembly *(use with 13.960" O.D. stainless steel impeller)*

ITEM NO.	PART NO.	DESCRIPTION	QTY.
—	22895	**Head Assembly,** *shred, .125 V, s.s., CC-D, (includes items 1–15)*	1
1	22899	**Top Support Ring,** *s.s., CC-D*	1
2	10048	**Hex Head Cap Screw,** *5/16-18 x 1-1/4", s.s.*	8
3	22206	**Washer,** *flat, .328 I.D. x .75 O.D. x .125*	8
4	22898	**Adjusting Screw,** *hex, Nylok, CC-D*	8
5	22889	**Shoe,** *shred, .125 V, gateless, s.s., (includes item 6)*	4
6	22894	**Dowel Pin,** *1/4" x 15/16"*	3
7	22888	**Shoe,** *shred, .125 V, gateless, s.s., (includes item 8)*	4
8	22894	**Dowel Pin,** *1/4" x 15/16" long*	3
9	22080	**Knife Holder,** *V-cut*	8
10	10038	**Hex Head Cap Screw,** *1/4-20 x 3/4", s.s.*	16
11	22077	**Knife Clamp,** *V-cut*	8
12	10224	**Hex Head Cap Screw,** *10-24 x 1/4", s.s.*	16
13	22070	**Knife,** *slicing, V-cut, s.s., (pkg. of 96 knives - use part no. 22069)*	8
14	22803	**Spacer**, *V-cut shred, (set of 8)*	1
15	22146	**Shipping Plate,** *(not shown)*	1
		OPTIONAL KNIVES	
—	22671	**Knife,** *slicing, V-cut, gold, for hard-to-cut products, (pkg. of 96 knives - use part no. 22672)*	8



22922 FULL SHRED (.070) & V SHRED, HARD PRODUCT, Stainless Steel Assembly *(use with 13.960" O.D. stainless steel impeller)*

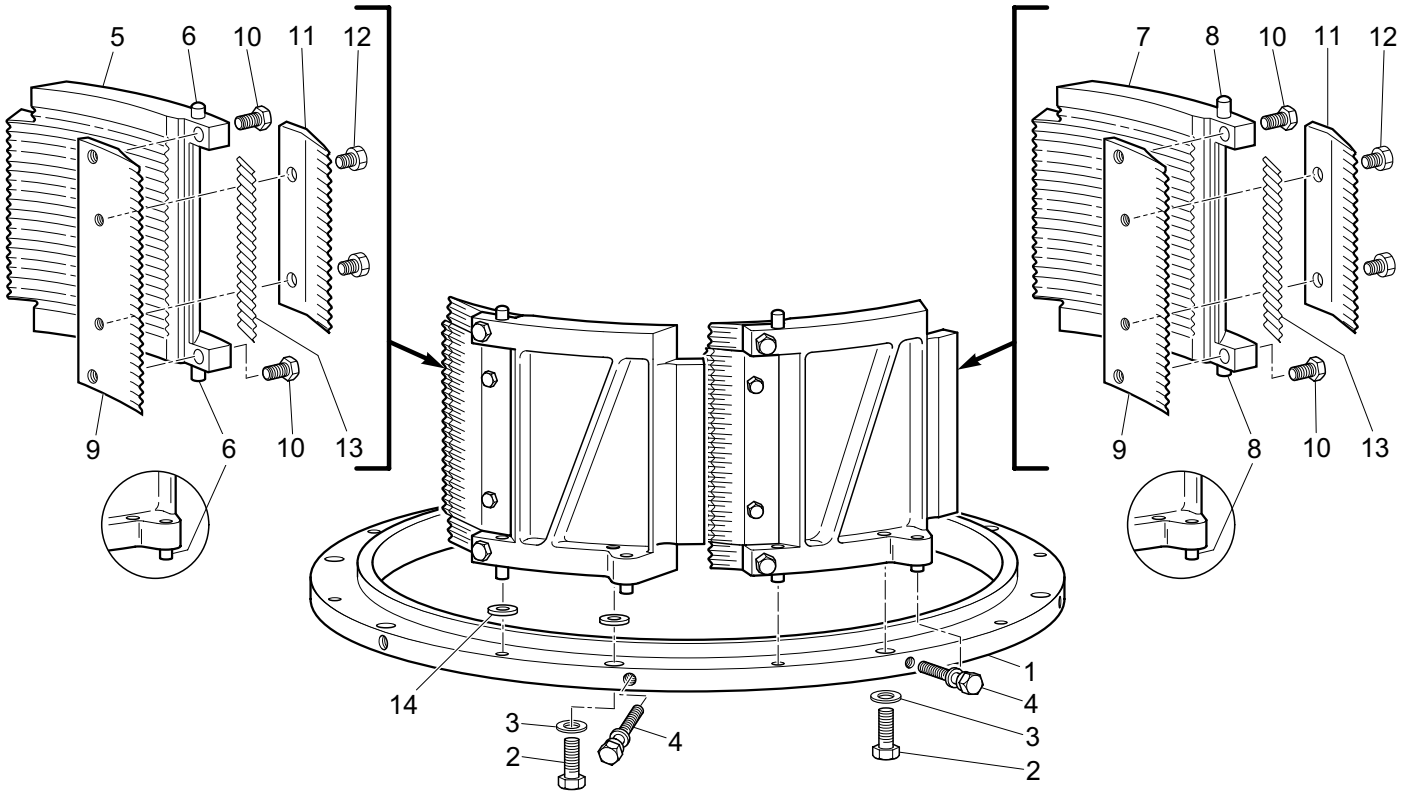
ITEM NO.	PART NO.	DESCRIPTION	QTY.
—	22922	**Head Assembly,** *shred, .125 V, hard product, s.s., CC-D, (includes items 1–17)*	1
1	22899	**Top Support Ring**, *s.s., CC-D*	1
2	10048	**Hex Head Cap Screw,** *5/16-18 x 1-1/4", s.s.*	8
3	22206	**Washer,** *flat, .328 I.D. x .75 O.D. x .125*	8
4	22898	**Adjusting Screw,** *hex, Nylok, CC-D*	8
5	22889	**Shoe,** *shred, .125 V, gateless, s.s., (includes item 6)*	4
6	22894	**Dowel Pin,** *1/4" x 15/16", long*	3
7	22888	**Shoe,** *shred, .125 V, gateless, s.s., (includes item 8)*	4
8	22894	**Dowel Pin,** *1/4" x 15/16" long*	3
9	22676	**Knife Holder,** *V-cut, hard product*	8
10	10038	**Hex Head Cap Screw,** *1/4-20 x 3/4", s.s.*	16
11	22677	**Knife Clamp,** *V-cut, hard product*	8
12	22859	**Screw,** *knife clamp, 10-24 x 1/4"*	16
13	22671	**Knife,** *slicing, V-cut, golden, (pkg. of 96 knives - use part no. 22672)*	8
14	22803	**Spacer,** *V-cut shred, (set of 8)*	1
15	22146	**Shipping Plate,** *(not shown)*	1



See the addendum for updated information

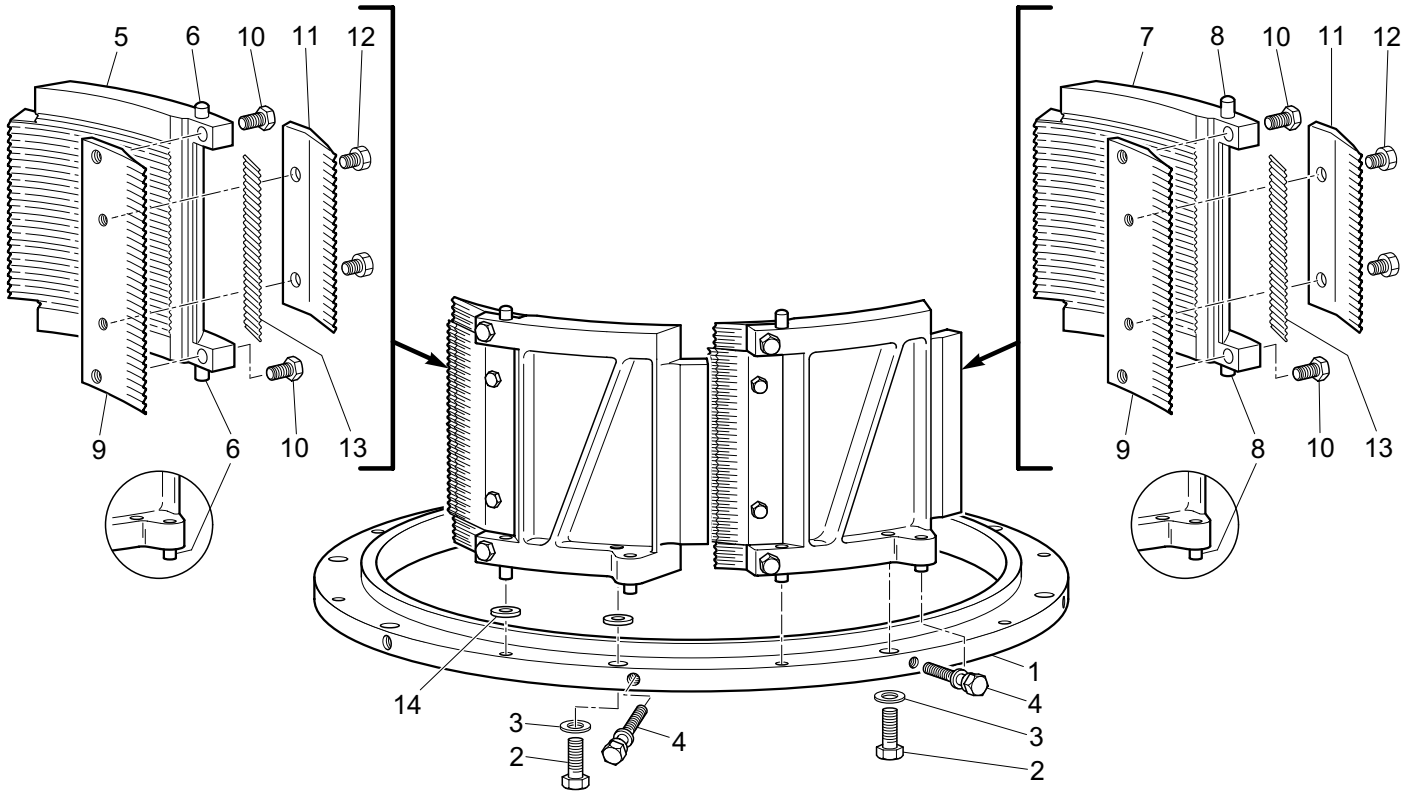
23140 FULL SHRED (.097) & V SHRED, Stainless Steel Assembly *(use with 13.960" O.D. stainless steel impeller)*

ITEM NO.	PART NO.	DESCRIPTION	QTY.
—	23140	**Head Assembly,** *shred, .170 V, s.s., CC-D, (includes items 1–15)*	1
1	22899	**Top Support Ring,** *s.s., CC-D*	1
2	10048	**Hex Head Cap Screw,** *5/16-18 x 1-1/4", s.s.*	8
3	22206	**Washer,** *flat, .328 I.D. x .75 O.D. x .125*	8
4	22898	**Adjusting Screw,** *hex, Nylok, CC-D*	8
5	23134	**Shoe,** *shred, .170 V, gateless, s.s., (includes item 6)*	4
6	22894	**Dowel Pin,** *1/4" x 15/16" long*	3
7	23133	**Shoe,** *shred, .170 V, gateless, s.s., (includes item 8)*	4
8	22894	**Dowel Pin,** *1/4" x 15/16" long*	3
9	23141	**Knife Holder,** *.170 V-cut*	8
10	10038	**Hex Head Cap Screw,** *1/4-20 x 3/4", s.s.*	16
11	23142	**Knife Clamp,** *.170 V-cut*	8
12	10224	**Hex Head Cap Screw,** *10-24 x 1/4", s.s.*	16
13	23143	**Knife,** *slicing, .170 V-cut, s.s., (pkg. of 96 knives - use part no. 23144)*	8
14	23139	**Spacer,** *.170 V-cut shred, (set of 8)*	1
15	22146	**Shipping Plate,** *(not shown)*	1
		OPTIONAL KNIVES	
—	23137	**Knife,** *slicing, .170 V-cut, gold, for hard-to-cut products, (pkg. of 96 knives - use part no. 23138)*	8



23132 FULL SHRED (.097) & V SHRED, HARD PRODUCT, Stainless Steel Assembly *(use with 13.960" O.D. stainless steel impeller)*

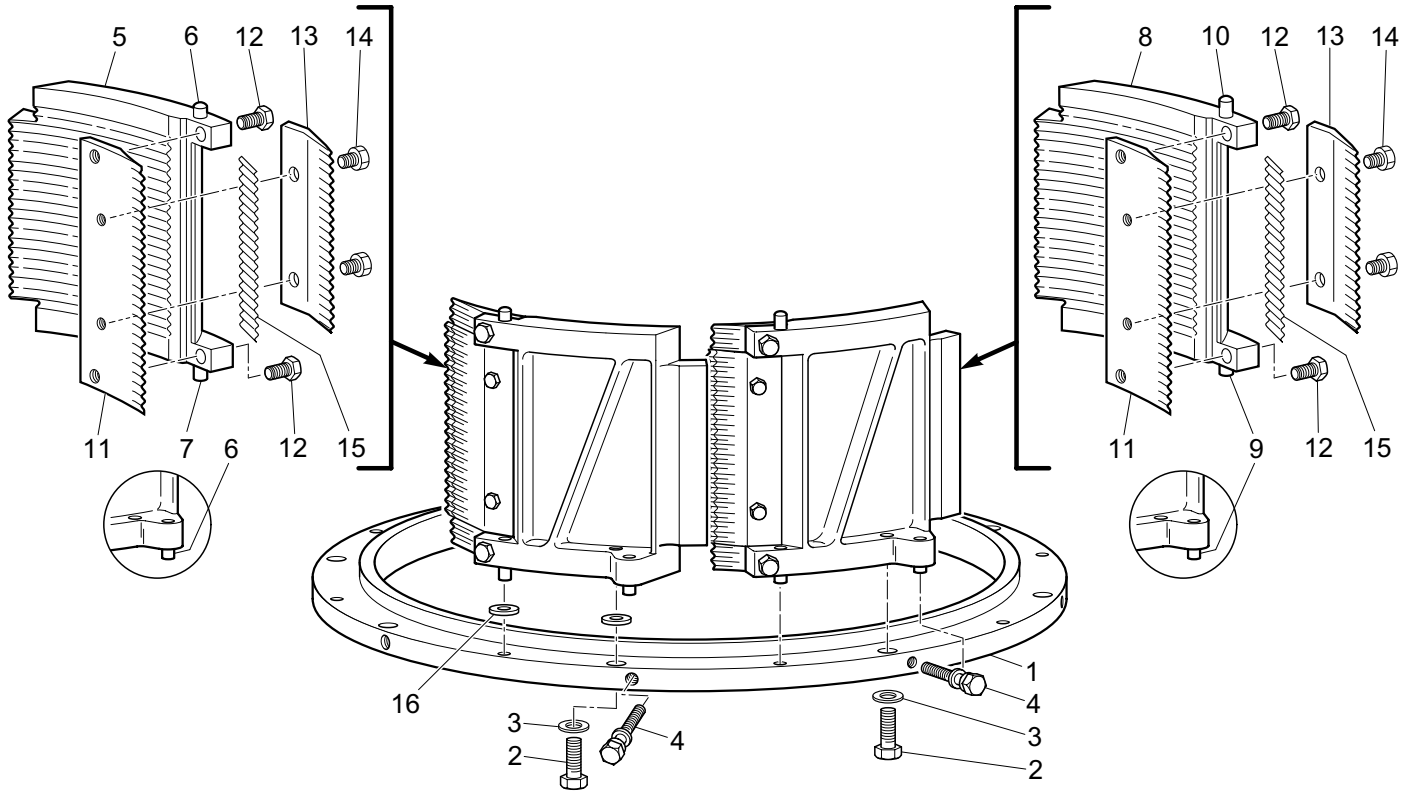
ITEM NO.	PART NO.	DESCRIPTION	QTY.
—	23132	**Head Assembly,** *shred, .170 V, hard product, s.s., CC-D, (includes items 1–17)*	1
1	22899	**Top Support Ring,** *s.s., CC-D*	1
2	10048	**Hex Head Cap Screw,** *5/16-18 x 1-1/4", s.s.*	8
3	22206	**Washer,** *flat, .328 I.D. x .75 O.D. x .125*	8
4	22898	**Adjusting Screw,** *hex, Nylok, CC-D*	8
5	23134	**Shoe,** *shred, .170 V, gateless, s.s., (includes item 6)*	4
6	22894	**Dowel Pin,** *1/4" x 15/16" long*	3
7	23133	**Shoe,** *shred, .170 V, gateless, s.s., (includes item 8)*	4
8	22894	**Dowel Pin,** *1/4" x 15/16" long*	3
9	23135	**Knife Holder,** *.170 V-cut, hard product*	8
10	10038	**Hex Head Cap Screw,** *1/4-20 x 3/4", s.s.*	16
11	23136	**Knife Clamp,** *.170 V-cut, hard product*	8
12	22859	**Screw,** *knife clamp, 10-24 x 1/4"*	16
13	23137	**Knife,** *slicing, .170 V-cut, golden, (pkg. of 96 knives - use part no. 23138).*	8
14	23139	**Spacer,** *.170 V-cut shred, (set of 8)*	1
15	22146	**Shipping Plate,** *(not shown)*	1



See the addendum for updated information

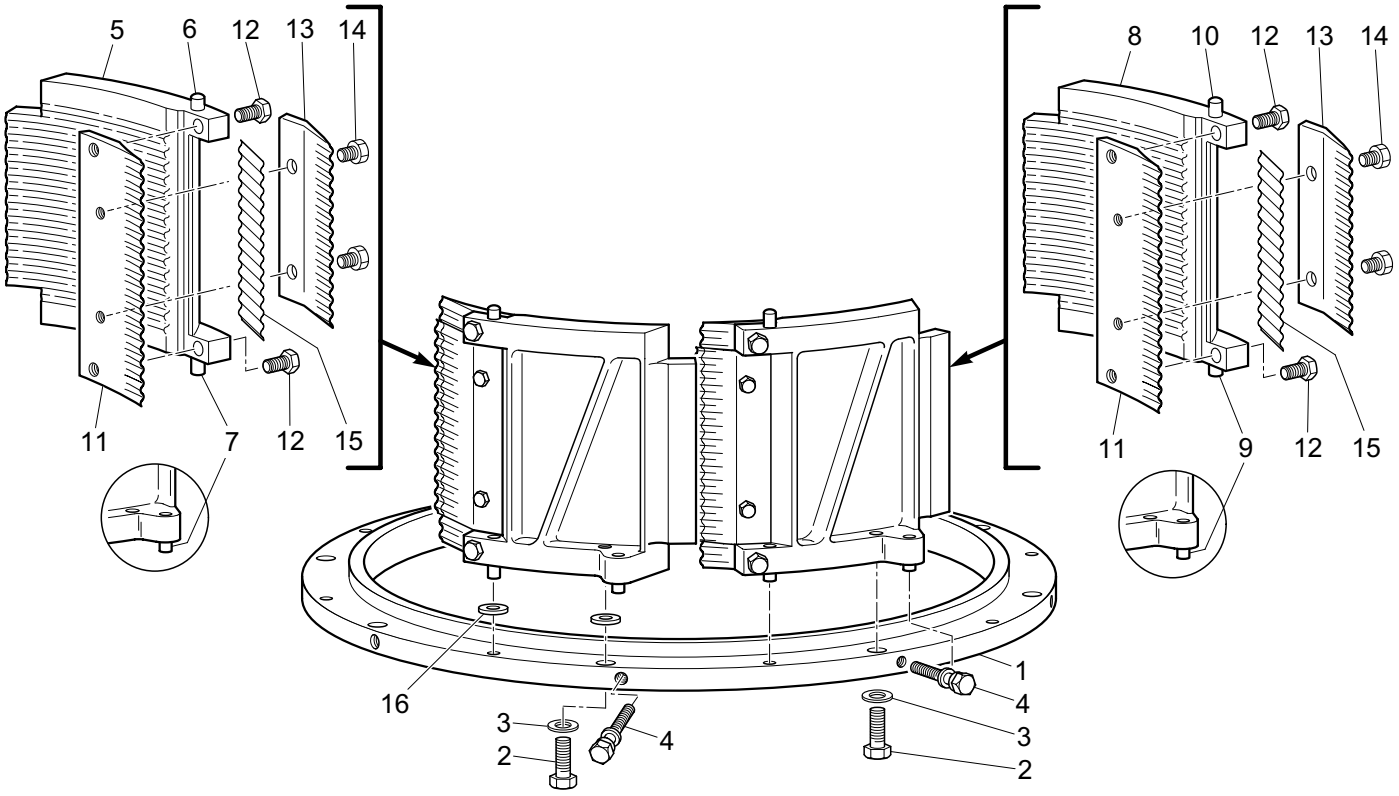
22896 FULL SHRED (.125) & V SHRED, Stainless Steel Assembly *(use with 13.960" O.D. stainless steel impeller)*

ITEM NO.	PART NO.	DESCRIPTION	QTY
—	22896	**Head Assembly,** *shred, .212 V, s.s., CC-D, (includes items 1–17)*	1
1	22899	**Top Support Ring,** *s.s., CC-D*	1
2	10048	**Hex Head Cap Screw,** *5/16-18 x 1-1/4", s.s.*	8
3	22206	**Washer,** *flat, .328 I.D. x .75 O.D. x .125*	8
4	22898	**Adjusting Screw,** *hex, Nylok, CC-D*	8
5	22891	**Shoe,** *shred, .212 V, gateless, s.s., (includes items 6 & 7)*	4
6	22894	**Dowel Pin,** *1/4" x 15/16" long*	2
7	23019	**Dowel Pin,** *1/4" x 1-1/16" long, s.s.*	1
8	22890	**Shoe,** *shred, .212 V, gateless, s.s., (includes items 9 & 10)*	4
9	22894	**Dowel Pin,** *1/4" x 15/16", long*	2
10	23019	**Dowel Pin,** *1/4" x 1-1/16" long, s.s.*	1
11	22684	**Knife Holder,** *.212 V-cut*	8
12	10038	**Hex Head Cap Screw,** *1/4-20 x 3/4", s.s.*	16
13	22685	**Knife Clamp,** *.212 V-cut*	8
14	10224	**Hex Head Cap Screw,** *10-24 x 1/4", s.s.*	16
15	22687	**Knife,** *slicing, .212 V-cut, s.s., (pkg. of 96 knives - use part no. 22689)*	8
16	22804	**Spacer,** *.212 V-cut shred, (set of 8)*	1
17	22146	**Shipping Plate,** *(not shown)*	1
		OPTIONAL KNIVES AND KNIFE CLAMP	
—	22857	**Knife,** *slicing, .212 V-cut, gold, for hard-to-cut products, (pkg. of 96 knives - use part no. 22858)*	8
—	23164	**Knife Clamp,** *.212 V-cut, hard product, for hard-to-cut products*	8



22897 OVAL SHRED & CRESCENT SHRED, Stainless Steel Assembly *(use with 13.960" O.D. stainless steel impeller)*

ITEM NO.	PART NO.	DESCRIPTION	QTY.
-	22897	**Head Assembly,** *shred, oval, s.s., CC-D, (includes items 1–17)*	1
1	22899	**Top Support Ring,** *s.s., CC-D*	1
2	10048	**Hex Head Cap Screw,** *5/16-18 x 1-1/4", s.s.*	8
3	22206	**Washer,** *flat, .328 I.D. x .75 O.D. x .125*	8
4	22898	**Adjusting Screw,** *hex, Nylok, CC-D*	8
5	22892	**Shoe,** *shred, oval, gateless, s.s., (includes items 6 & 7)*	4
6	22894	**Dowel Pin,** *1/4" x 15/16" long*	1
7	23019	**Dowel Pin,** *1/4" x 1-1/16" long*	2
8	22893	**Shoe,** *shred, oval, gateless, s.s., (includes items 9 & 10)*	4
9	22894	**Dowel Pin,** *1/4" x 15/16" long*	2
10	23019	**Dowel Pin,** *1/4" x 1-1/16" long*	1
11	22182	**Knife Holder,** *crinkle*	8
12	10038	**Hex Head Cap Screw,** *1/4-20 x 3/4", s.s.*	16
13	22076	**Knife Clamp,** *crinkle*	8
14	10224	**Hex Head Cap Screw,** *10-24 x 1/4", s.s.*	16
15	22212	**Knife,** *slicing, crinkle, s.s., (pkg. of 96 knives - use part no. 22210)*	8
16	22802	**Spacer,** *oval shred, (set of 8)*	1
17	22146	**Shipping Plate,** *(not shown)*	1
		OPTIONAL KNIVES AND KNIFE CLAMP	
—	22788	**Knife,** *slicing, crinkle, gold, for hard-to-cut products, (pkg. of 96 knives - use part no. 22787)*	8
—	23163	**Knife Clamp,** *crinkle, hard product, for hard-to-cut products*	8

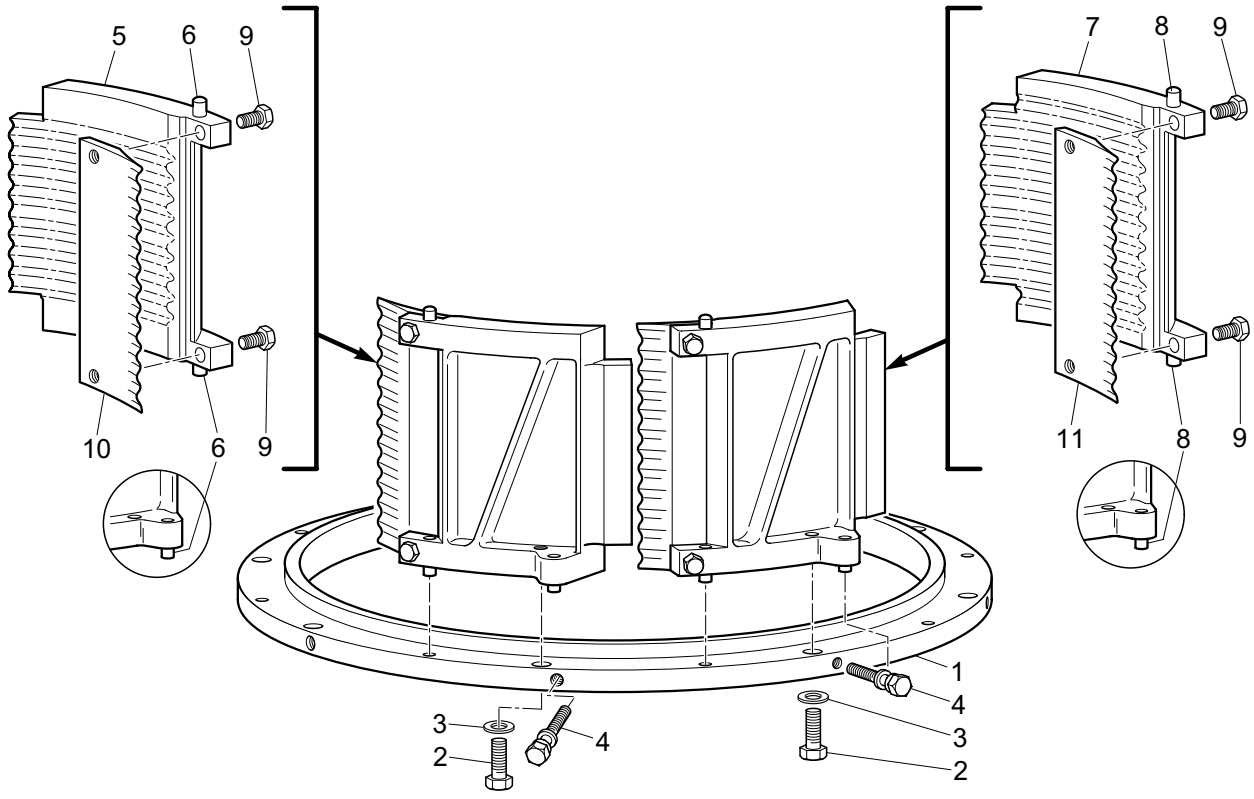


See the addendum for updated information

23190 WIDE OVAL SHRED & WIDE CRESCENT SHRED, Stainless Steel Assembly *(use with 13.960" O.D. stainless steel impeller)*

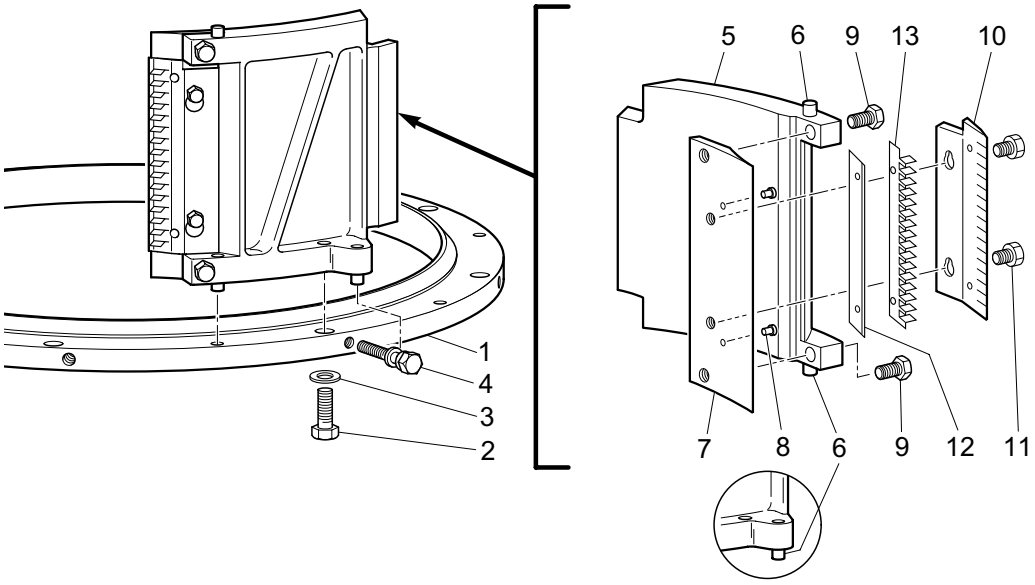
ITEM NO.	PART NO.	DESCRIPTION	QTY.
-	23190	**Head Assembly,** *shred, wide oval, s.s., CC-D, (includes items 1–12)*	1
1	22899	**Top Support Ring,** *s.s.*	1
2	10048	**Hex Head Cap Screw,** *5/16-18 x 1-1/4", s.s.*	8
3	22206	**Washer,** *flat, .328 I.D. x .75 O.D. x .125*	8
4	22898	**Adjusting Screw,** *hex, Nylok, CC-D*	8
5	23185	***Shoe,** *wide oval, gateless, s.s., (includes item 6)*	4
6	22894	**Dowel Pin,** *1/4" x 15/16" long*	3
7	23186	***Shoe,** *wide oval, gateless, s.s., offset, (includes item 8)*	4
8	22894	**Dowel Pin,** *1/4" x 15/16" long*	3
9	10038	**Hex Head Cap Screw,** *1/4-20 x 3/4", s.s.*	16
10	23180	**Knife,** *wide oval, s.s.*	4
11	23181	**Knife,** *wide oval, offset, s.s.*	4
12	22146	**Shipping Plate for Head,** *(not shown)*	1

* Alternate 23185 and 23186 (offset shoe) around top support ring.



23147 1/4" STRIP CUT, Stainless Steel Assembly *(use with 13.960" O.D. stainless steel impeller)*

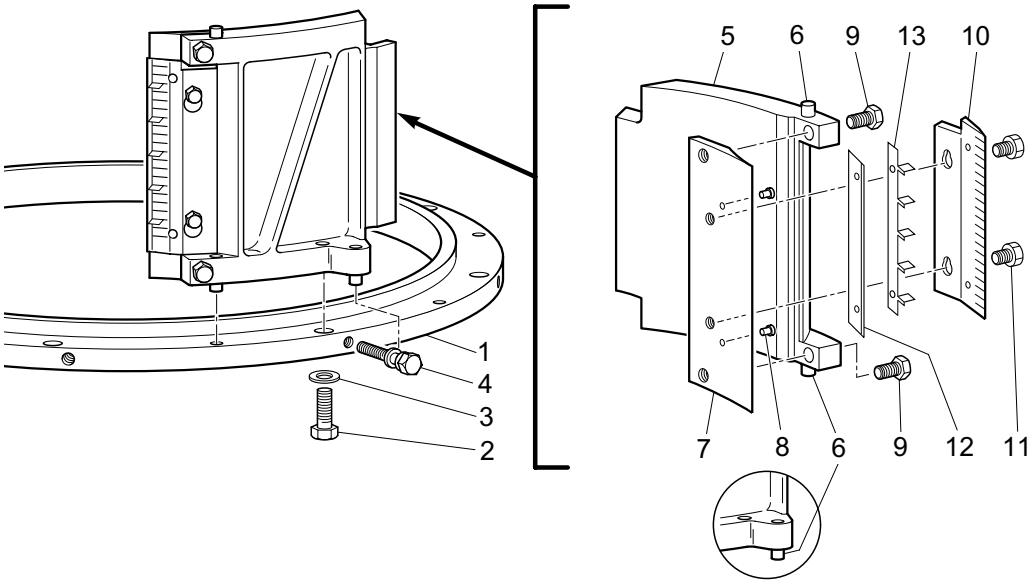
ITEM NO.	PART NO.	DESCRIPTION	QTY.
—	23147	**Head Assembly,** *strip cut, 1/4" wide, s.s., CC-D, (includes items 1–14)*	1
1	22899	**Top Support Ring,** *s.s., CC-D*	1
2	10048	**Hex Head Cap Screw,** *5/16-18 x 1-1/4"*	8
3	22206	**Washer,** *flat, .328 I.D. x .75 O.D. x .125*	8
4	22898	**Adjusting Screw,** *hex, Nylok, CC-D*	8
5	23149	**Shoe,** *slicing, flat, gateless, s.s., (includes item 6)*	8
6	22894	**Dowel Pin,** *1/4" x 5/16" long*	3
7	22181	**Knife Holder,** *flat, (includes item 8)*	8
8	22071	**Locating Pin**	2
9	10038	**Hex Head Cap Screw,** *1/4-20 x 3/4", s.s.*	16
10	22860	**Knife Clamp,** *strip cut, 1/4"*	8
11	10224	**Hex Head Cap Screw,** *10-24 x 1/4", s.s.*	16
12	22064	**Knife,** *slicing, flat, s.s., (pkg. of 96 knives - use part no. 22294)*	8
13	22861	**Knife,** *strip cut, 1/4", (pkg. of 96 knives - use part no. 22862)*	8
14	22146	**Shipping Plate,** *(not shown)*	1
		OPTIONAL KNIVES	
—	22794	**Knife,** *slicing, flat, heavy-duty bevel, gold, for hard-to-cut products, (pkg. of 96 knives - use part no. 22793)*	8
—	22936	**Knife,** *slicing, flat, standard bevel, gold, for hard-to-cut products, (pkg. of 96 knives - use part no. 22937)*	8



See the addendum for updated information

23148 3/4" STRIP CUT, Stainless Steel Assembly *(use with 13.960" O.D. stainless steel impeller)*

ITEM NO.	PART NO.	DESCRIPTION	QTY.
—	23148	**Head Assembly,** *strip cut, 3/4" wide, s.s., CC-D, (includes items 1–14)*	1
1	22899	**Top Support Ring,** *s.s., CC-D*	1
2	10048	**Hex Head Cap Screw,** *5/16-18 x 1-1/4", s.s.*	8
3	22206	**Washer,** *flat, .328 I.D. x .75 O.D. x .125*	8
4	22898	**Adjusting Screw,** *hex, Nylok, CC-D*	8
5	23149	**Shoe,** *slicing, flat, gateless, s.s., (includes item 6)*	8
6	22894	**Dowel Pin,** *1/4" x 5/16" long*	3
7	22181	**Knife Holder,** *flat, (includes item 8)*	8
8	22071	**Locating Pin**	2
9	10038	**Hex Head Cap Screw,** *1/4-20 x 3/4", s.s.*	16
10	22219	**Knife Clamp,** *strip cut, 3/16", s.s.*	8
11	10224	**Hex Head Cap Screw,** *10-24 x 1/4", s.s.*	16
12	22064	**Knife,** *slicing, flat, s.s., (pkg. of 96 knives - use part no. 22294)*	8
13	22781	**Knife,** *strip cut, 3/4", (pkg. of 96 knives - use part no. 22783)*	8
14	22146	**Shipping Plate,** *(not shown)*	1
		OPTIONAL KNIVES	
—	22794	**Knife,** *slicing, flat, heavy-duty bevel, gold, for hard-to-cut products, (pkg. of 96 knives - use part no. 22793)*	8
—	22936	**Knife,** *slicing, flat, standard bevel, gold, for hard-to-cut products, (pkg. of 96 knives - use part no. 22937)*	8

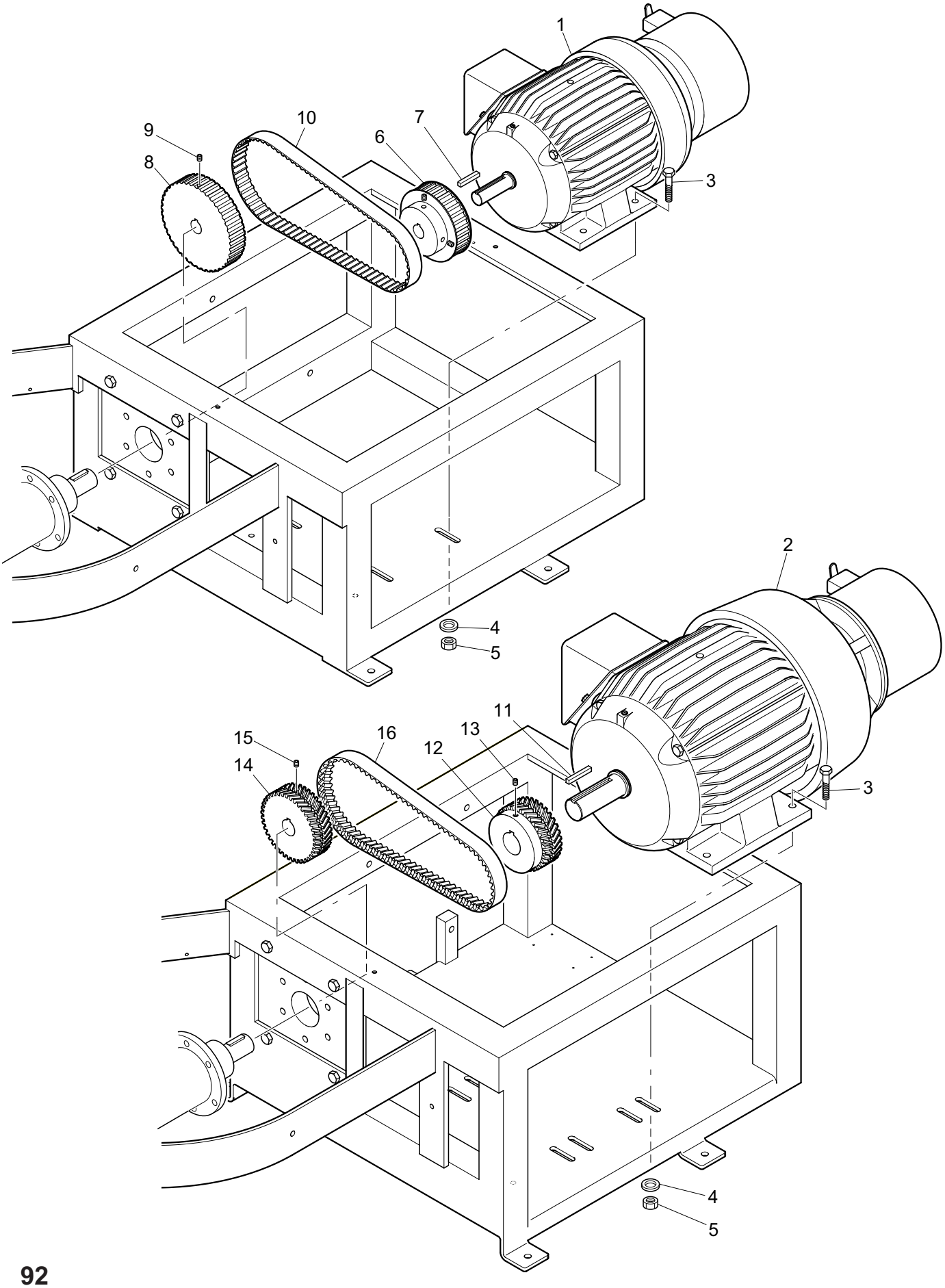


This page intentionally left blank.

PARTS

Motor With Drive Parts

See the addendum for updated information

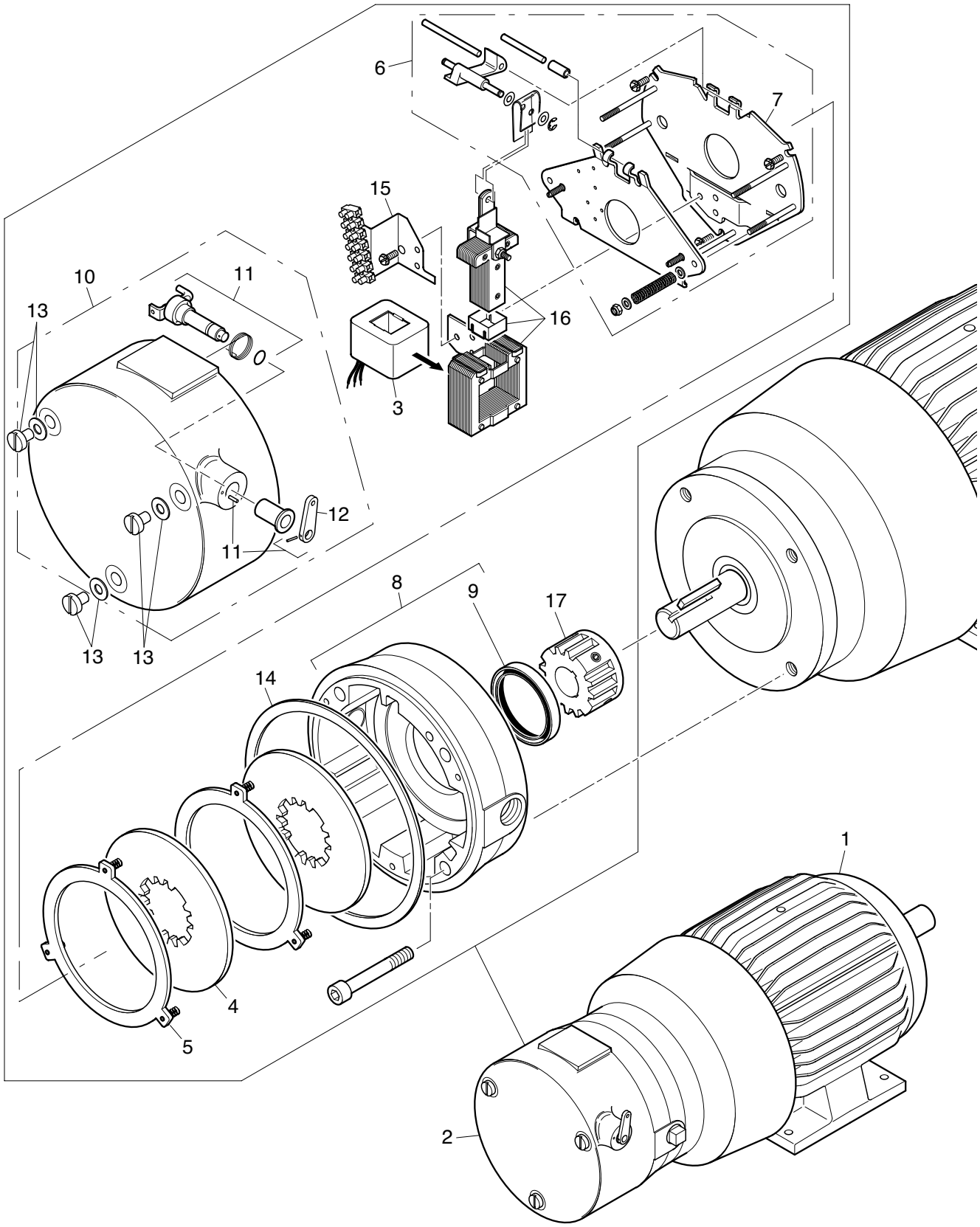


ITEM NO.	PART NO.	DESCRIPTION	QTY.
1*	12918	**Motor with Brake,** *5 H.P., 200-208 volts*	1
	12861	**Motor with Brake,** *5 H.P., 230-400 volts*	1
	12865	**Motor with Brake,** *5 H.P., 230-460 volts*	1
	12919	**Motor with Brake,** *5 H.P., 575 volts*	1
2**	23255	**Motor with Brake,** *7-1/2 H.P., 200/208 volts*	1
	23259	**Motor with Brake,** *7-1/2 H.P., 230/400 volts*	1
	23236	**Motor with Brake,** *7-1/2 H.P., 230/460 volts*	1
	23256	**Motor with Brake,** *7-1/2 H.P., 575 volts*	1
	23257	**Motor with Brake,** *10 H.P., 200/208 volts*	1
	23260	**Motor with Brake,** *10 H.P., 230/400 volts*	1
	23237	**Motor with Brake,** *10 H.P., 230/460 volts*	1
	23258	**Motor with Brake,** *10 H.P., 575 volts*	1
3	10060	**Hex Head Cap Screw,** *3/8-16 x 1-1/2", s.s.*	4
4	10270	**Washer,** *flat, 3/8", s.s., thick*	4
5	10249	**Hex Nut,** *3/8-16, s.s., locking, thick*	4
5 H.P. DRIVE PARTS, 60 HERTZ			
—	22921	**Drive Assembly,** *5 H.P., 448 RPM, CC-D, (includes items 6–10)*	1
6	22990	**Pulley,** *timing, 32 teeth*	1
7	18066	**Key,** *1/4" x 1/4" x 2"*	1
8	22989	**Pulley,** *timing, 42 teeth, (includes item 9)*	1
9	10140	**Socket Set Screw,** *5/16-18 x 3/8", 17-4, Nylok*	1
10	22991	**Timing Belt,** *360H100*	1
5 H.P. DRIVE PARTS, 50 HERTZ			
—	22995	**Drive Assembly,** *5 H.P., 448 RPM, 50 Hz, (includes items 6–10)*	1
6	22993	**Pulley,** *timing, 39 teeth*	1
7	18066	**Key,** *1/4" x 1/4" x 2"*	1
8	22989	**Pulley,** *timing, 42 teeth, (includes item 9)*	1
9	10140	**Socket Set Screw,** *5/16-18 x 3/8", 17-4, Nylok*	1
10	22994	**Timing Belt,** *390H100*	1
7.5 & 10 H.P. DRIVE PARTS, 60 HERTZ			
—	23244	**Drive Parts Assembly,** *7.5–10 H.P., 448 RPM, 60 Hz, (includes items 11–16)*	1
11	20174	**Key,** *5/16" x 5/16" x 1-15/16"*	1
12	23239	**Pulley,** *timing, 34 teeth, Eagle PD, (includes item 13)*	1
13	10142	**Socket Set Screw,** *5/16-18 x 5/8", cup point, s.s.*	1
14	23243	**Pulley,** *timing, 44 teeth, Eagle PD, (includes item 15)*	1
15	10142	**Socket Set Screw,** *5/16-18 x 5/8", cup point, s.s.*	1
16	51550	**Timing Belt,** *Eagle PD, W-800*	1
7.5 & 10 H.P. DRIVE PARTS, 50 HERTZ			
—	23245	**Drive Parts Assembly,** *7.5–10 H.P., 448 RPM, 50 Hz, (includes items 11–16)*	1
11	20174	**Key,** *5/16" x 5/16" x 1-15/16"*	1
12	23241	**Pulley,** *timing, 40 teeth, Eagle PD, (includes item 13)*	1
13	10142	**Socket Set Screw,** *5/16-18 x 5/8", cup point, s.s.*	1
14	23243	**Pulley,** *timing, 44 teeth, Eagle PD, (includes item 15)*	1
15	10142	**Socket Set Screw,** *5/16-18 x 5/8", cup point, s.s.*	1
16	51550	**Timing Belt,** *Eagle PD, W-800*	1

* See pages 94–97 for motor brake information.
** 7-1/2 and 10 H.P. motors use 20 lb/ft brakes. Contact the factory for repair part infotmation.

⚠ **CAUTION:** *Do not operate the Model CC-D at higher than recommended speeds. To do so could create a safety hazard and cause excessive wear on machine parts.*

See the addendum for updated information



ITEM NO.	PART NO.	DESCRIPTION	QTY.
1	*	**Motor,** *with brake, (includes item 2)*	1
2	12897	**Brake Assembly,** *10 pound foot with 110 volt coil, 56200, use with across the line electrical assemblies, (includes items 3–17)*	1
	12898	**Brake Assembly,** *10 pound foot with 220 volt coil, 56200, use with across the line electrical assemblies, (includes items 3–17)*	1
	12899	**Brake Assembly,** *10 pound foot with 575 volt coil, 56200, use with across the line electrical assemblies, (includes items 3–17)*	1
3	12884	**K4 Solenoid Coil,** *110/120 volts*	1
	12885	**K4 Solenoid Coil,** *200-240 volts*	1
	12886	**K4 Solenoid Coil,** *575 volts*	1
4	12890	**Friction Disc**	2
5	12891	**Stationary Disc Kit**	2
6	12892	**Support Plate Assembly,** *10 pound foot, (includes item 7)*	1
7	12903	**Support Plate and Spring Stud Assembly**	1
8	12893	**Endplate and Seal Assembly,** *(includes item 9)*	1
9	12906	**Seal for Endplate**	1
10	12894	**Housing and Release Assembly,** *(includes items 11 & 12)*	1
11	12910	**Manual Release Assembly,** *(includes item 12)*	1
12	12913	**Handle,** *manual release, s.s.*	1
13	12911	**Housing Nuts and Gaskets**	3
14	12905	**Gasket,** *housing and endplate*	1
15	12909	**Terminal Kit**	1
16	12904	**Plunger, Link and Frame Assembly**	1
17	12895	**Hub and Set Screw Assembly**	1

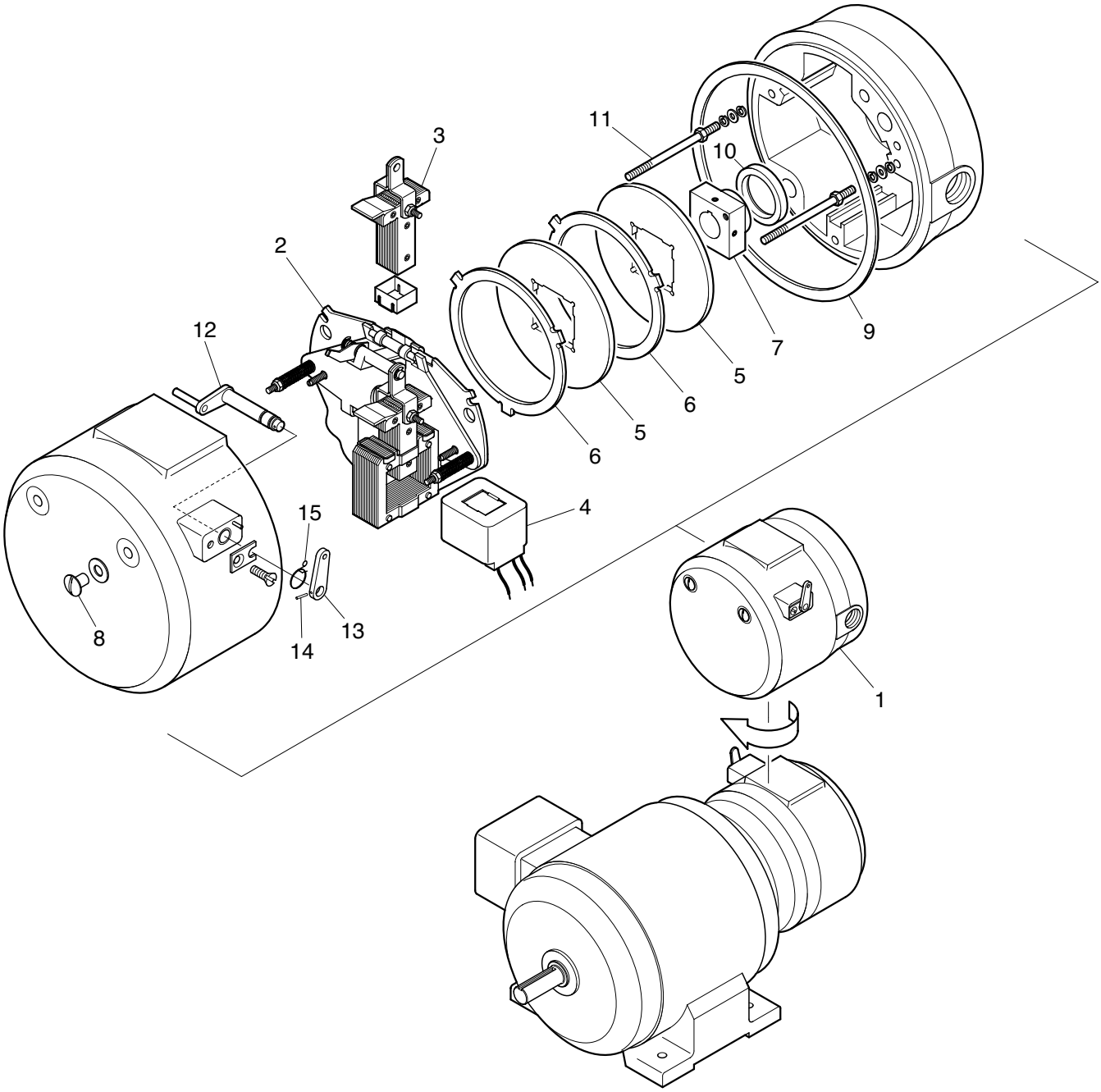
* See page 93.

NOTE: *Older motors may use the 55400 series brake; see page 97 for repair parts. Verify brake series number before ordering repair parts.*

PARTS

10 LB-FT Stearns 55400 Brake Assembly

See the addendum for updated information



10 LB-FT Stearns 55400 Brake Assembly

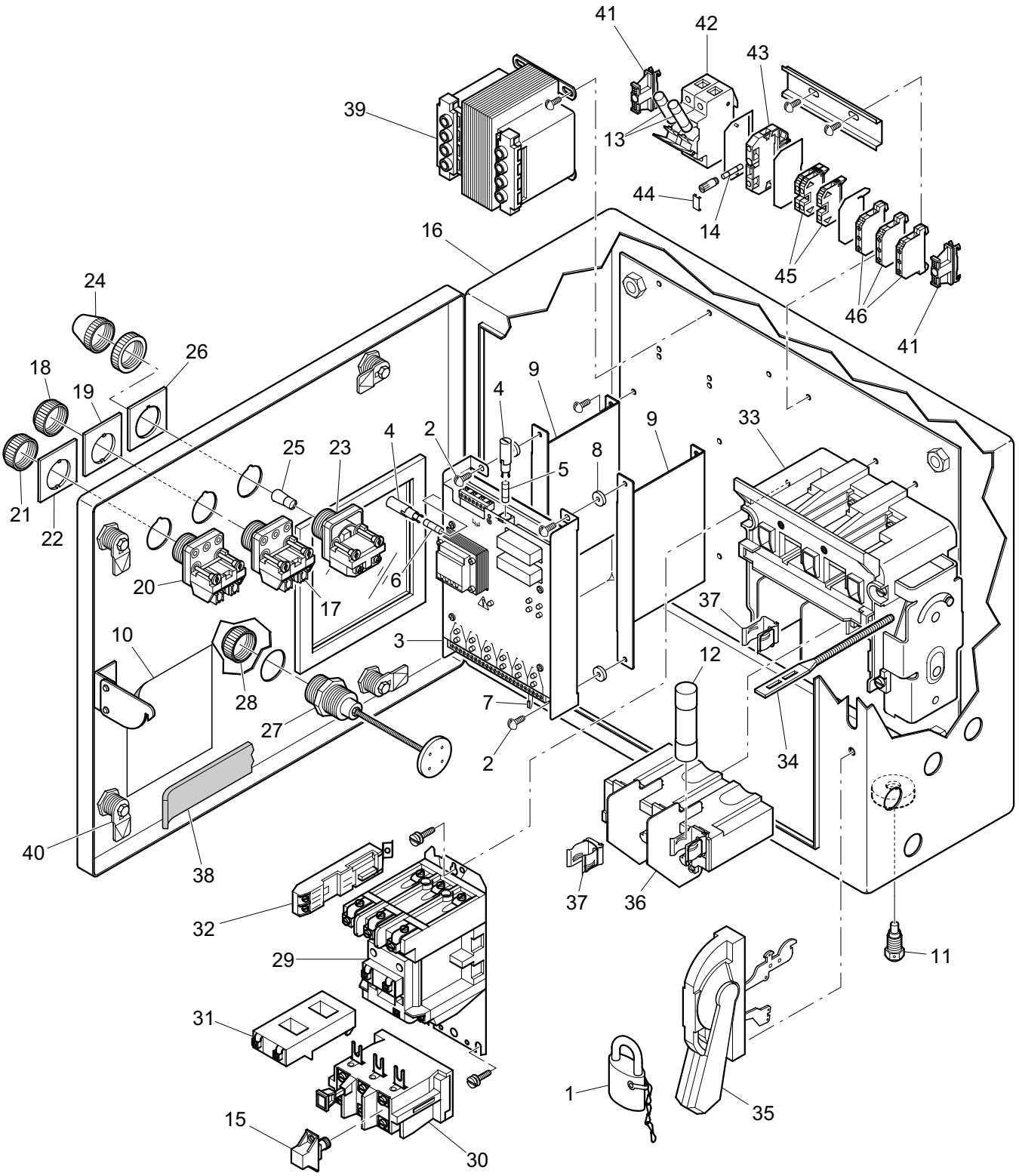
NOTE: *Some machines were sold with Stearns 55400 series brakes. While these brakes are no longer available, the repair parts listed below can be purchased. Contact Urschel Laboratories if a complete brake assembly replacement is necessary.*

ITEM NO.	PART NO.	DESCRIPTION	QTY.
1	—	**Brake Assembly,** *10 pound foot, 7/8" bore, (includes items 2–15)*	1
2	12627	**Support Plate Assembly,** *(includes item 3)*	1
3	12668	**Plunger, Link and Frame Assembly**	1
4	12624	**Solenoid Coil,** *200-240 volts, 50/60 Hz*	1
	12626	**Solenoid Coil,** *575 volts, 60 Hz, (for use in Canada)*	1
	12670	**Solenoid Coil,** *110 volts, 50/60 Hz, (for use with stop/start station)*	1
5	12628	**Friction Disc**	3
6	12629	**Stationary Disc**	3
7	12664	**Hub and Set Screw Assembly,** *6 pound foot brake, 7/8" bore*	1
	12671	**Hub and Set Screw Assembly,** *10 pound foot brake, 7/8" bore*	1
8	12666	**Housing Nut with Gasket**	2
9	12669	**Gasket,** *housing to end plate*	1
10	12709	**Seal,** *end plate*	1
11	12663	**Housing Stud**	2
12	12674	**Release Lever**	1
13	12913	**Handle,** *manual release, s.s., 56200 brake*	1
14	12661	**Roll Pin,** *1/16 x 1/2" long*	1
15	12665	**Torsion Spring**	1

PARTS

Electrical Assembly (NEMA components, 5 H.P. motor)

See the addendum for updated information



Electrical Assembly (NEMA components, 5 H.P. motor)

ITEM NO.	PART NO.	DESCRIPTION	QTY.
—	23220	**Electrical Assembly,** *200-240/460 volts, CC-D, (includes items 1–15)*	1
—	23223	**Electrical Assembly,** *CC-D, 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*	6
8	12633	**Rubber Washer,** *3/16 x 5/8 x 1/8" thick*	4
9	*	**Amplifier Bracket**	2
10	13723	**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" for 200-240/460 volt (includes items 17–46)*	1
	23221	**Combination Starter,** *size "1" for 575 volt (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
24	12598	**Lens,** *Pilot Light*	1
25	12599	**Bulb,** *pilot light*	1
26	12600	**Plate,** *blank grey, (pilot light)*	1
27	12603	**Reset Button,** *(includes item 28)*	1
28	12604	**Rubber Boot,** *reset*	1
29	16676	**Starter,** *size "1", (includes items 30–32)*	1
30	12667	**Overload Relay**	1
31	13548	**Operating Coil,** *for size 0 & 1 starter*	1
32	63579	**Auxiliary Contact,** *normally open*	1
33	13604	**Disconnect,** *30 amp*	1
34	63384	**Connecting Rod**	1
35	63383	**Operating Handle**	1
36	13605	**Fuse Trailer Block,** *(includes item 37)*	1
37	13381	**Fuse Clip Kit,** *(set of 6)*	1
38	*	**Door Gasket,** *(fitting and adhesive required)*	1
39	21267	**Control Circuit Transformer,** *75VA, (200-230/460 volt only)*	1
	21268	**Control Circuit Transformer,** *75VA, (575 volt only)*	1
40	21270	**Quarter Turn Latch Assembly,** *(Industrial Enclosures)*	4
	21271	**Quarter Turn Latch Assembly,** *(Hoffman Enclosures)*	4
41	12751	**End Anchor,** *IEC*	2
42	12930	**Modular Fuse Holder,** *2 pole*	1
43	12763	**Fuse Terminal,** *5 x 20 mm, IEC, (includes item 44)*	1
44	12781	**Transparent Cover**	1
45	12760	**Terminal,** *IEC*	3
46	12750	**Earthing Terminal,** *IEC*	3

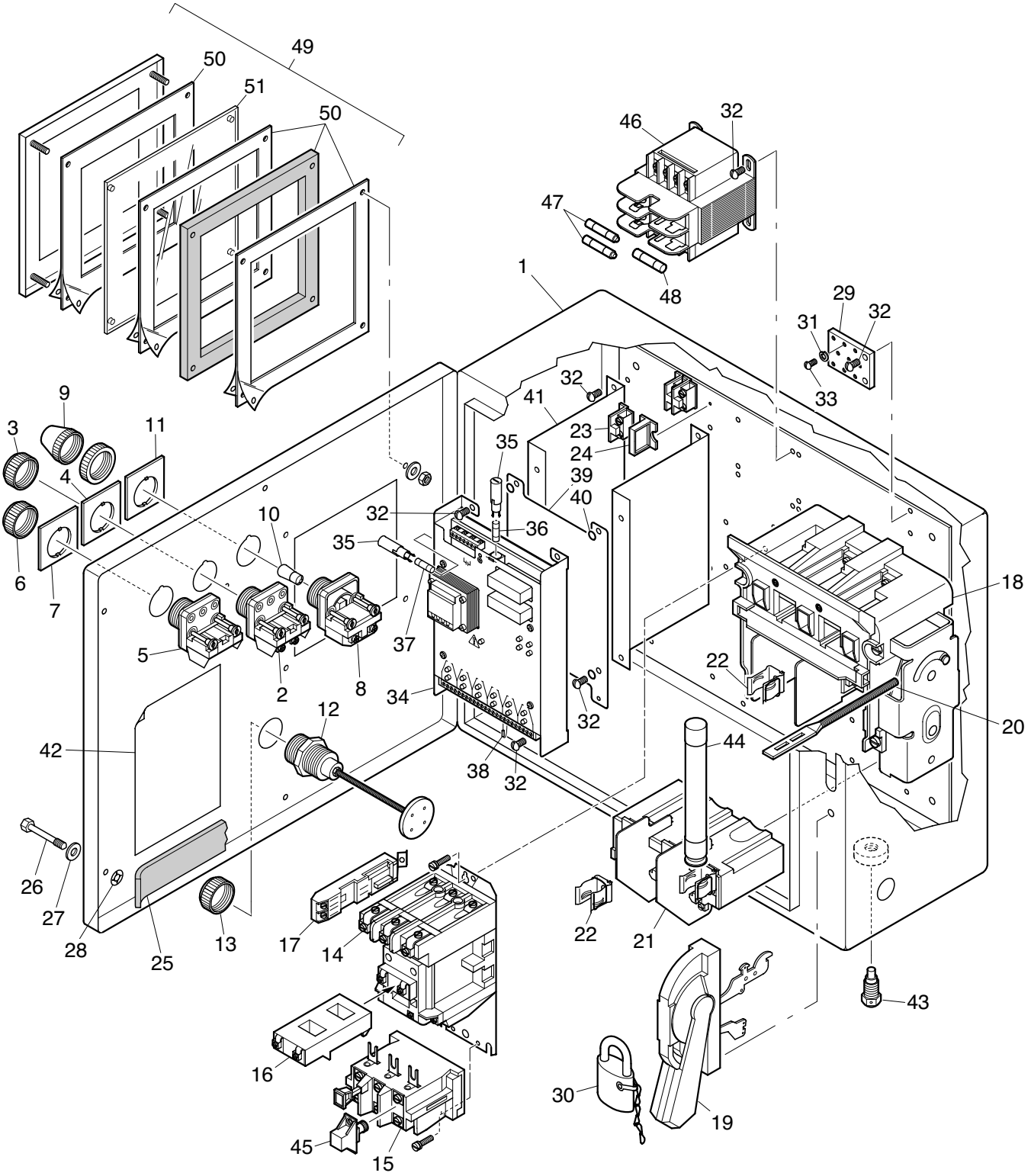
* Consult the factory.
** See charts on page 110.
Electrical assemblies also include safety switches and related parts; see pages 108 & 109.

PARTS

See the addendum for updated information

Electrical Assembly (NEMA components, 5 H.P. motor)

The following pages 100 & 101 show the electrical assembly used prior to the one currently supplied on new machines. Repair parts are available except as noted. See pages 98 & 99 for the currently available assembly.



Electrical Assembly (NEMA components, 5 H.P. motor)

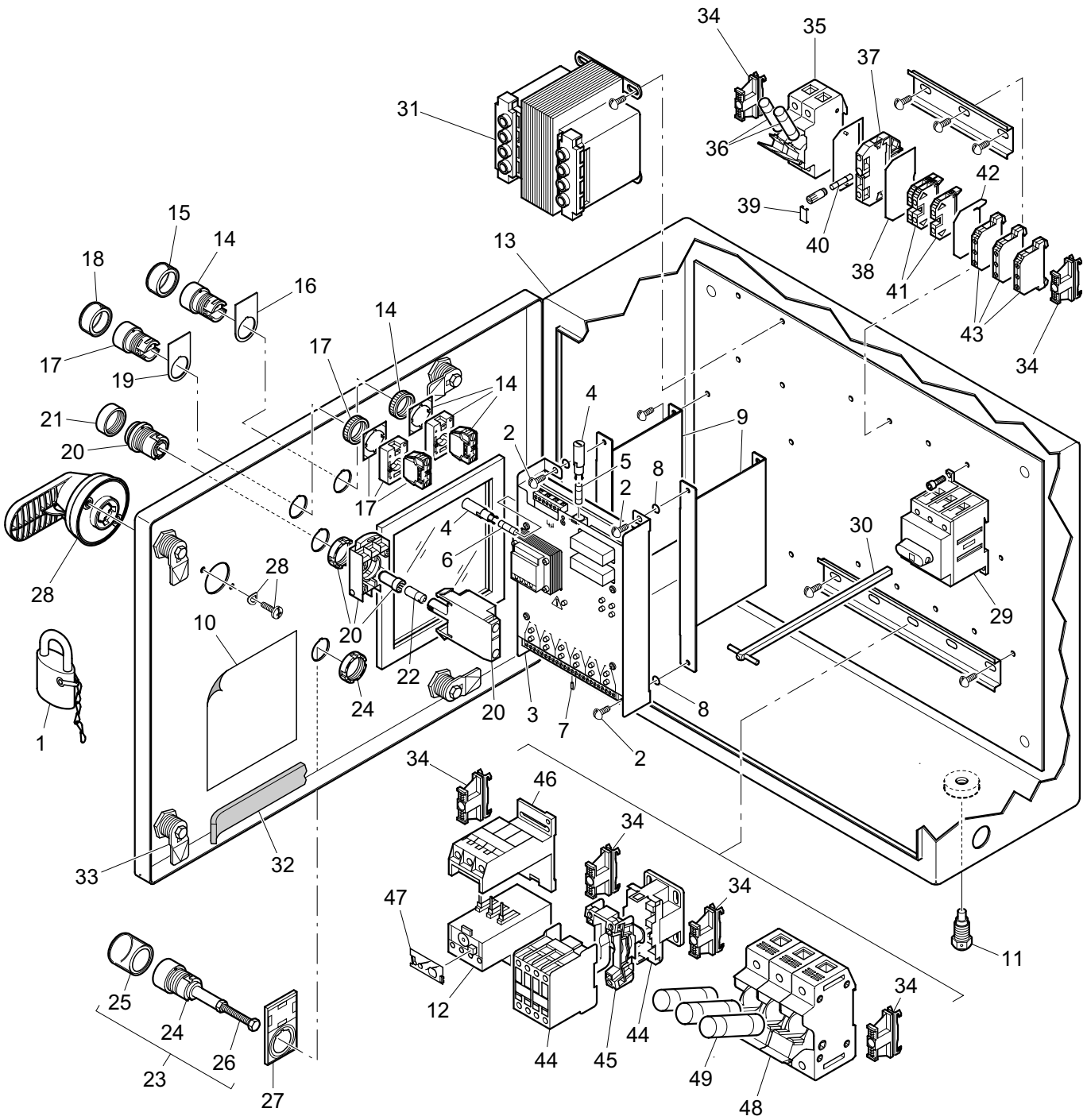
ITEM NO.	PART NO.	DESCRIPTION	QTY.
—	§23094	**Electrical Assembly,** *(includes items 1–48 below)*	1
1	§22988	**Combination Starter,** *size "1", (includes items 2–29)*	1
2	13449	**Push Button,** *start, (includes item 3)*	1
3	60218	**Rubber Boot,** *start*	1
4	12605	**Legend Plate,** *start*	1
5	13450	**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
26	19551	**Fastener,** *10-32 x 1.63", special*	4
27	13602	**Nylon Washer**	4
28	13618	**Retainer**	4
29	13518	**Earthing Bar**	1
30	13408	**Padlock,** *with chain*	1
31	10012	**Lock Washer,** *3/16"*	3
32	10625	**Round Head Machine Screw,** *w/washer, 10-32 x 1/2"*	14
33	10276	**Round Head Machine Screw,** *10-24 x 5/16"*	10
34	63737	****Amplifier,** *(includes items 35–38)*	1
35	13673	**Adapter,** *fuse*	2
36	13671	**Fuse,** *.630 amp.*	1
37	13672	**Fuse,** *.125 amp.*	1
38	63755	**Resistor,** *22 kOhm*	6
39	63747	**Adapter Plate**	1
40	12633	**Rubber Washer,** *3/16 x 5/8 x 1/8" thick*	4
41	13561	**Amplifier Bracket**	2
42	11801	**Wiring Diagram**	1
43	11593	**Breather/Drain,** *1/4"*	1
44	*	**Fuse**	3
45	***	**Heater Element**	3
46	*	**Transformer,** *(includes items 47 & 48)*	1
47	12691	**Fuse,** *.6 amp.*	2
48	13426	**Fuse,** *.6 amp.*	1
49	13599	**Window Replacement Kit,** *(includes items 50 & 51)*	1
50	13713	**Window Gasket Kit**	1
51	—	**Window,** *(not sold separately)*	1

§ Not for sale; part numbers supplied for reference only.
* Consult the factory.
** A retrofit assembly (part no. 63756) is required to adapt 63737 amplifier to machines currently using 63068 amplifier. Consult factory for further information.
*** See chart on page 111.
Wiring diagram is illustrated on page 111.
Electrical assemblies also include safety switches and related parts, see pages 108 & 109.

PARTS

Electrical Assembly (CE compliant, 5 H.P. motor)

See the addendum for updated information



Electrical Assembly (CE compliant, 5 H.P. motor)

ITEM NO.	PART NO.	DESCRIPTION	QTY.
—	23218	**Electrical Assembly,** *380-415 volts, IEC, CC-D, (includes items 1–12)*	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*	6
8	12633	**Rubber Washer,** *3/16 x 5/8 x 1/8" thick*	4
9	*	**Amplifier Bracket**	2
10	23217	**Wiring Diagram,** *IEC, 5 H.P., with brake*	1
11	11593	**Breather/Drain,** *1/4"*	1
12	**	**Overload Relay,** *(use with item 46 Overload Base Adapter)*	1
13	23203	**Combination Starter with Lugs,** *IEC, 22 amp.,(includes items 14–49)*	1
14	12975	**Start Button Assembly,** *(includes item 15)*	1
15	12977	**Protective Boot,** *flush head, IEC*	1
16	12978	**Name Plate,** *(I) start, IEC*	1
17	12976	**Stop Button Assembly,** *(includes item 18)*	1
18	12977	**Protective Boot,** *flush head, IEC*	1
19	12979	**Name Plate,** *(O) stop, IEC*	1
20	12757	**Pilot Light,** *IEC, (includes items 21 & 22)*	1
21	12758	**Pilot Light Lens,** *IEC*	1
22	12599	**Bulb,** *pilot light, IEC*	1
23	12747	**Reset Button Assembly,** *IEC, (includes item 24–26)*	1
24	12744	**Reset Button,** *IEC*	1
25	12748	**Protective Cap,** *flush head, IEC*	1
26	12745	**Reset Extender,** *IEC*	1
27	12746	**Reset Insert with Holder**	1
28	21241	**IEC Disconnect Switch Handle**	1
29	12942	**Disconnect Switch,** *3 pole, non-fusible, 40A*	1
30	12779	**IEC Extended Shaft,** *10.43", (cut to length)*	1
31	12928	**Control Circuit Transformer,** *(380-415 volts)*	1
32	*	**Door Gasket,** *(fitting and adhesive required)*	1
33	21270	**Quarter Turn Latch Assembly,** *(Industrial Enclosures)*	4
	21271	**Quarter Turn Latch Assembly,** *(Hoffman Enclosures)*	4
34	12751	**End Anchor,** *IEC*	2
35	12930	**Modular Fuse Holder,** *2 pole*	1
36	12924	**Transformer Fuse,** *FU2 (primary), .50 amp*	2
37	12763	**Fuse Terminal,** *5 x 20 mm, IEC, (includes items 38 & 39)*	1
38	*	**Barrier and Spacer,** *IEC*	1
39	12781	**Transparent Cover**	1
40	12923	**Transformer Fuse,** *FU3 (secondary),.50 amp*	1
41	12760	**Terminal,** *IEC, (includes item 42)*	3
42	*	**Barrier,** *IEC*	1
43	12750	**Earthing Terminal,** *IEC*	2
44	12753	**Contactor,** *22 A., IEC, (includes item 45)*	1
45	12754	**Coil,** *110/120 volts, 50/60 Hertz, IEC*	1
46	13677	**Overload Base Adapter**	1
47	12871	**Transparent Cover for Adjustment Dial**	1
48	12973	**Modular Fuse Holder,** *3 pole*	1
49	**	**Fuse,** *FU1, class J*	3

* Consult the factory

** See chart on page 112.

Wiring diagram is illustrated on page 112.

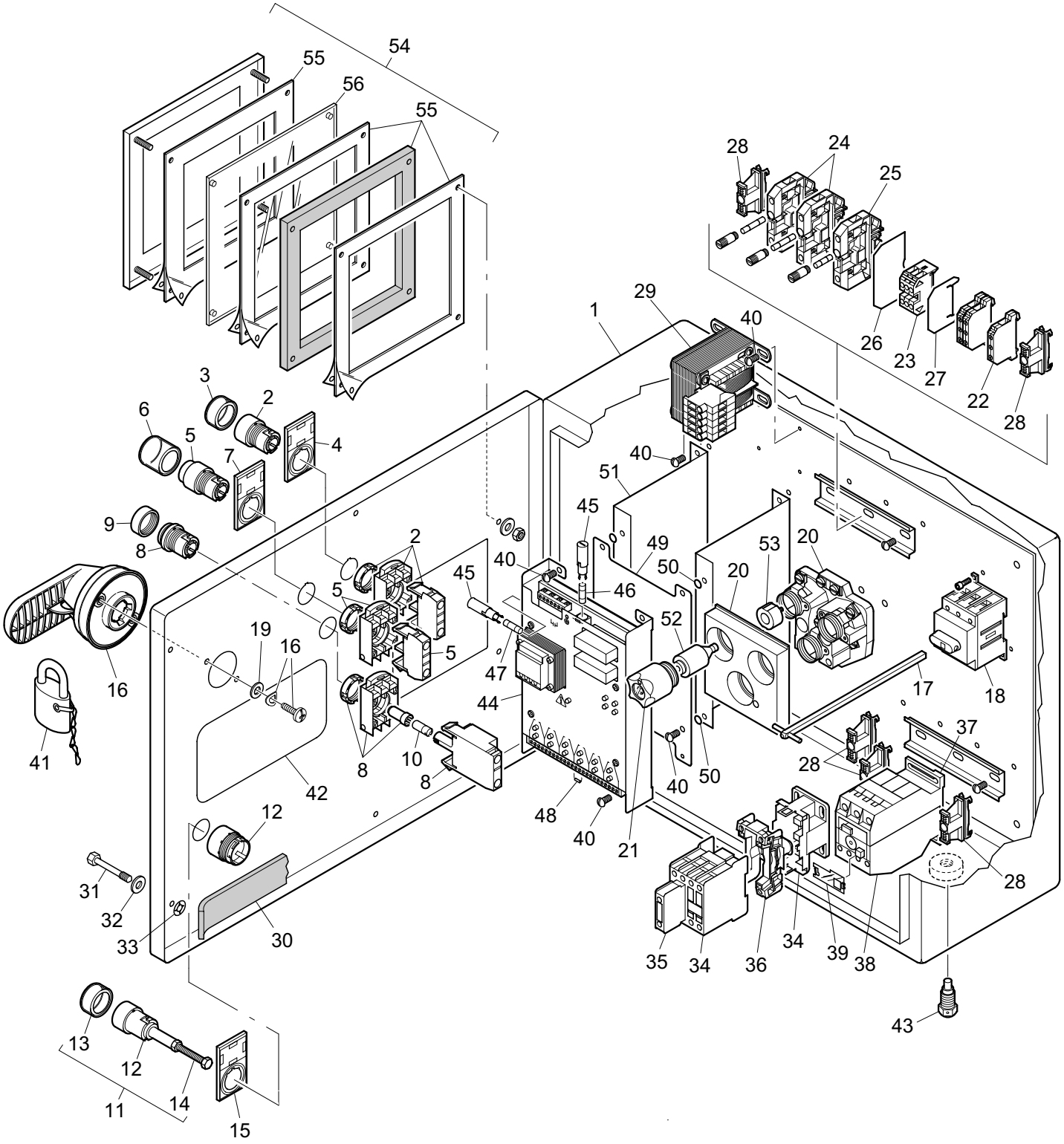
Electrical assemblies also include safety switches and related parts, see pages 108 & 109.

PARTS

Electrical Assembly (CE compliant, 5 H.P. motor)

See the addendum for updated information

The following pages 104 & 105 show the electrical assembly used prior to the one currently supplied on new machines. Repair parts are available except as noted. See pages 102 & 103 for the currently available assembly.



Electrical Assembly (CE compliant, 5 H.P. motor)

ITEM NO.	PART NO.	DESCRIPTION	QTY.
—	§23104	**Electrical Assembly,** *IEC, (includes items 1–51)*	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 items 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	21241	**Disconnect Switch Handle,** *IEC (retrofit kit may be necessary, consult the factory)*	1
17	12779	**IEC Extended Shaft,** *10.43", (cut to length)*	1
18	12942	**Disconnect Switch,** *IEC*	1
19	10005	**Washer,** *flat, no. 8*	2
20	13491	**Fuse Base,** *25 amp., E27 thread*	1
21	13489	**Screw Cap,** *E27 thread*	3
22	12750	**Earthing Terminal,** *IEC*	3
23	12760	**Terminal,** *IEC*	3
24	12764	**Fuse Terminal,** *6.3 x 32 mm, IEC, (uses fuse 13675; includes item 26)*	2
25	12763	**Fuse Terminal,** *5 x 20 mm, IEC, (uses fuse 13674; includes item 26)*	1
26	*	**Barrier and Spacer,** *IEC*	1
27	*	**Barrier,** *IEC*	1
28	12751	**End Anchor,** *IEC*	5
29	*	**Control Circuit Transformer**	1
30	12882	**Door Gasket,** *(fitting and adhesive required)*	1
31	19551	**Fastener,** *10-32 x 1.63", special*	4
32	13602	**Nylon Washer**	4
33	13618	**Retainer**	4
34	12753	**Contactor,** *22 A., IEC, (includes items 35 & 36)*	1
35	12755	**Front-Mount Auxiliary Contact,** *N.O.*	1
36	12754	**Coil,** *110/120 volts, 50/60 Hertz, IEC*	1
37	13677	**Overload Base Adapter**	1
38	***	**Overload Relay**	1
39	13678	**Transparent Cover for Adjustment Dial**	1
40	10625	**Round Head Machine Screw,** *w/washer, 10-32 x 1/2"*	14
41	13408	**Padlock,** *with chain*	1
42	23105	**Wiring Diagram,** *IEC, 5 H.P., with brake*	1
43	11593	**Breather/Drain,** *1/4"*	1
44	63737	****Amplifier,** *(includes items 45–48)*	1
45	13673	**Adapter**	2
46	13671	**Fuse,** *.630 amp.*	1
47	13672	**Fuse,** *.125 amp.*	1
48	63755	**Resistor,** *22 kOhm*	6
49	63747	**Adapter Plate**	1
50	12633	**Rubber Washer,** *3/16" x 5/8" x 1-1/8" thick*	4
51	13561	**Amplifier Bracket**	2
52	*	**Fuse**	3
53	*	**Fuse Adapter**	3
54	13599	**Window Replacement Kit,** *(includes items 55 & 56)*	1
55	13713	**Window Gasket Kit**	1
56	—	**Window,** *(not sold separately)*	1

§ Not for sale; part numbers supplied for reference only.

* Consult factory

** A retrofit assembly (part no. 63756) is required to adapt 63737 amplifier to machines currently using 63068 amplifier. Consult factory for further information.

*** See chart on page 112.

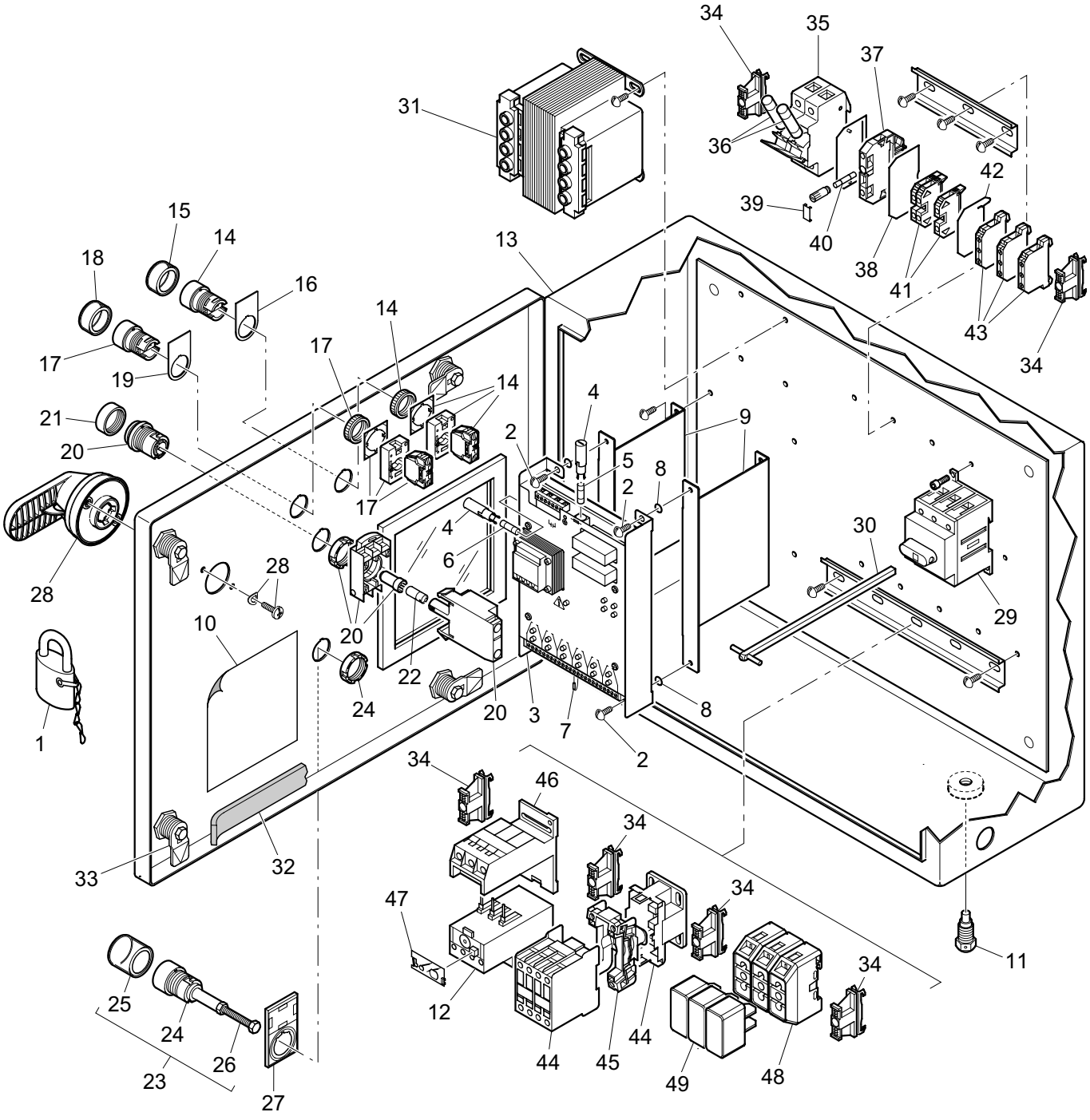
Wiring diagram is illustrated on page 112.

Electrical assemblies also include safety switches and related parts, see pages 108 & 109.

PARTS

Electrical Assembly (7.5 & 10 H.P. motors)

See the addendum for updated information



Electrical Assembly (7.5 & 10 H.P. motors)

ITEM NO.	PART NO.	DESCRIPTION	QTY.
—	23247	**Electrical Assembly,** *CC-D, 7.5-10 H.P., (includes items 1–12)*	1
1	13408	**Padlock,** *with chain*	1
2	10625	**Round Head Machine Screw,** *w/washer, 10-32 x 1/2"*	8
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*	8
8	12633	**Rubber Washer,** *3/16 x 5/8 x 1/8" thick*	4
9	*	**Amplifier Bracket**	2
10	23248	**Wiring Diagram,** *North America*	1
	23249	**Wiring Diagram,** *elsewhere, IEC*	1
11	11593	**Breather/Drain,** *1/4"*	1
12	**	**Overload Relay,** *(use with item 46 Overload Base Adapter)*	1
13	23246	**Electrical Enclosure,** *34 amp.,(includes items 14–49)*	1
14	21263	**Start Button Assembly,** *(includes item 15)*	1
15	12977	**Protective Boot,** *flush head, IEC*	1
16	12978	**Name Plate,** *(I) start, IEC*	1
17	12976	**Stop Button Assembly,** *(includes item 18)*	1
18	12977	**Protective Boot,** *flush head, IEC*	1
19	12979	**Name Plate,** *(O) stop, IEC*	1
20	12757	**Pilot Light,** *IEC, (includes items 21 & 22)*	1
21	12758	**Pilot Light Lens,** *IEC*	1
22	12599	**Bulb,** *pilot light, IEC*	1
23	12747	**Reset Button Assembly,** *IEC, (includes item 24–26)*	1
24	12744	**Reset Button,** *IEC*	1
25	12748	**Protective Cap,** *flush head, IEC*	1
26	12745	**Reset Extender,** *IEC*	1
27	12746	**Reset Insert with Holder**	1
28	21241	**IEC Disconnect Switch Handle**	1
29	12942	**Disconnect Switch,** *3 pole, non-fusible, 40A*	1
30	12779	**IEC Extended Shaft,** *10.43", (cut to length)*	1
31	**	**Control Circuit Transformer,**	1
32	*	**Door Gasket,** *(fitting and adhesive required)*	1
33	21270	**Quarter Turn Latch Assembly,** *(Industrial Enclosures)*	4
	21271	**Quarter Turn Latch Assembly,** *(Hoffman Enclosures)*	4
34	12751	**End Anchor,** *IEC*	2
35	12930	**Modular Fuse Holder,** *2 pole*	1
36	**	**Transformer Fuse,** *FU2 (primary)*	2
37	12763	**Fuse Terminal,** *5 x 20 mm, IEC, (includes items 38 & 39)*	1
38	*	**Barrier and Spacer,** *IEC*	1
39	12781	**Transparent Cover**	1
40	12923	**Transformer Fuse,** *FU3 (secondary),.50 amp*	1
41	12760	**Terminal,** *IEC, (includes item 42)*	3
42	*	**Barrier,** *IEC*	1
43	12750	**Earthing Terminal,** *IEC*	2
44	12987	**Contactor,** *34 A., IEC, (includes item 45)*	1
45		**Coil,** *110/120 volts, 50/60 Hertz, IEC*	1
46	13677	**Overload Base Adapter**	1
47	12871	**Transparent Cover for Adjustment Dial**	1
48	21324	**Fuse Base,** *60 amp, cube*	3
49	**	**Fuse,** *FU1, cube*	3

* Consult the factory

** See chart on page 113.

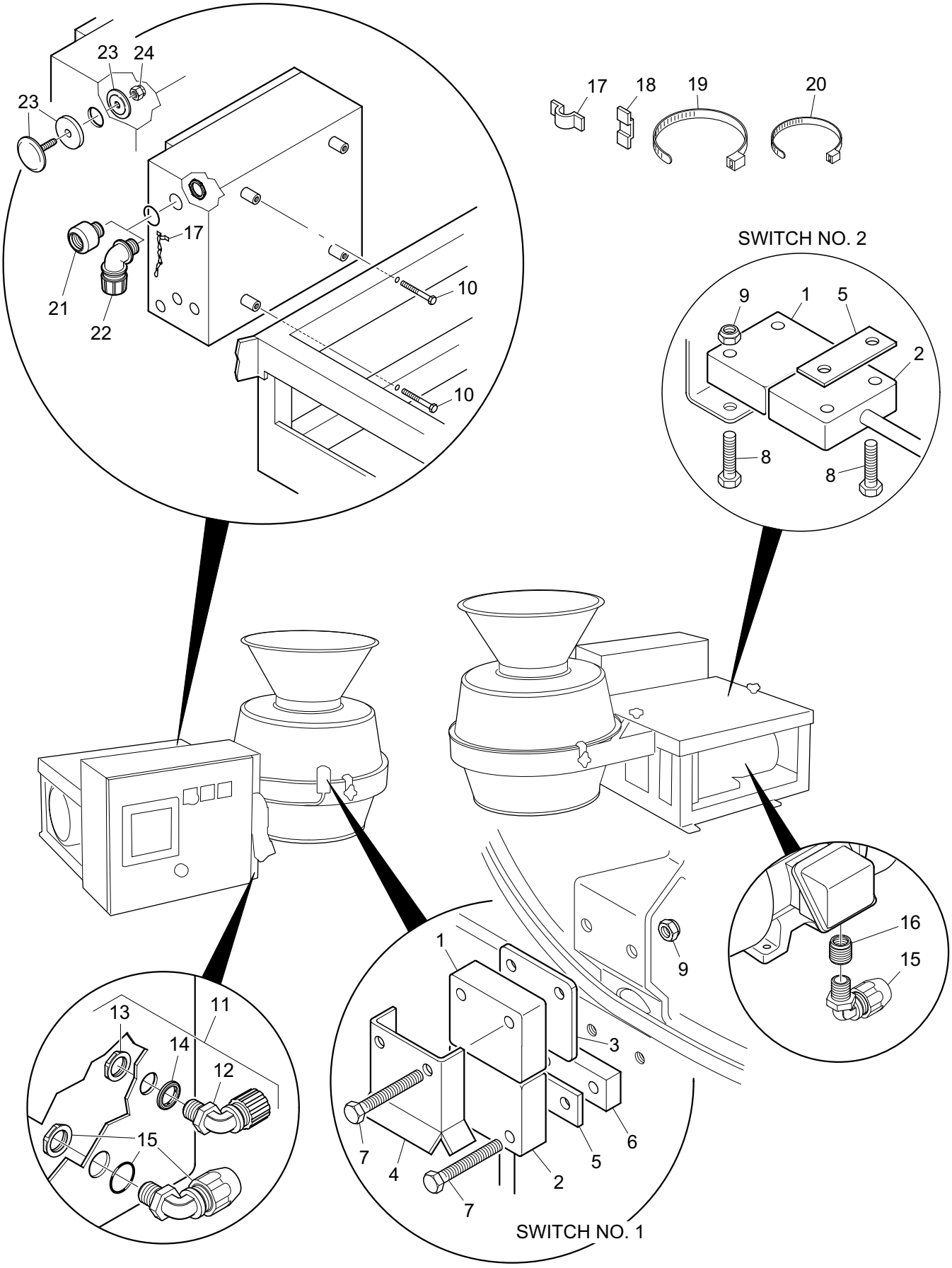
Wiring diagram is illustrated on page 113.

Electrical assemblies also include safety switches and related parts, see pages 108 & 109.

PARTS

Electrical Assembly (Switches)

See the addendum for updated information

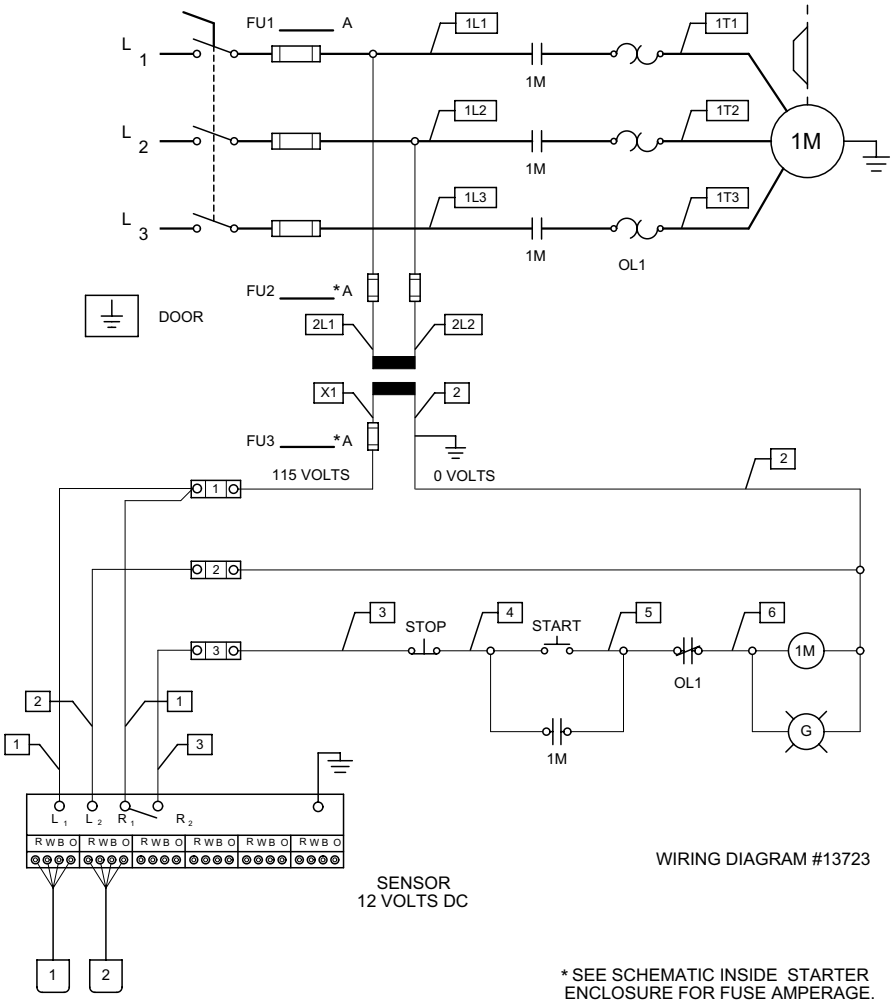


Electrical assemblies include the following items 1-20.

ITEM NO.	PART NO.	DESCRIPTION	QTY.
1	63741	**Actuator**	2
2	63738	**Sensor,** *6' lead*	2
3	22935	**Spacer,** *actuator bracket, CC-D*	1
4	63133	**Alignment Bracket**	1
5	63084	**Spacer,** *.037" thick*	10
6	12802	**Spacer,** *3/16"*	2
7	10233	**Hex Head Cap Screw,** *10-24 x 1", s.s.*	4
8	10351	**Hex Head Cap Screw,** *10-24 x 7/8", s.s.*	4
9	10231	**Hex Nut,** *10-24, s.s., locking*	4
10	10053	**Hex Head Cap Screw,** *5/16-18 x 2-1/2", s.s.*	4
11	11548	**Cord Connector,** *90°, 7/32", .250/.375, (includes items 12–14)*	2
12	11609	**Cord Connector,** *90°, .250/.375*	2
13	11611	**Lock Nut,** *1/2"*	2
14	11900	**Seal Washer,** *3/16" x 7/8" x 1-9/32"*	2
15	11614	**Conduit Connector,** *90°, 1/2"*	2
16	11502	**Reducing Bushing,** *1/2" x 3/4"*	1
17	13424	**Clip,** *chain*	2
18	13465	**Clip,** *cable tie*	2
19	11513	**Cable Tie**	10
20	11534	**Cable Tie,** *small*	18
THE FOLLOWING ITEMS ARE NOT INCLUDED WITH THE ELECTRICAL ASSEMBLY			
21	11582	**Conduit Hub**	1
22	11626	**Cord Connector,** *90°*	1
23	11591	**Hole Seal,** *1-3/8"*	1
24	10231	**Hex Nut,** *locking, 10-24, s.s.*	1

See the addendum for updated information

NEMA



WIRING DIAGRAM #13723

* SEE SCHEMATIC INSIDE STARTER ENCLOSURE FOR FUSE AMPERAGE.

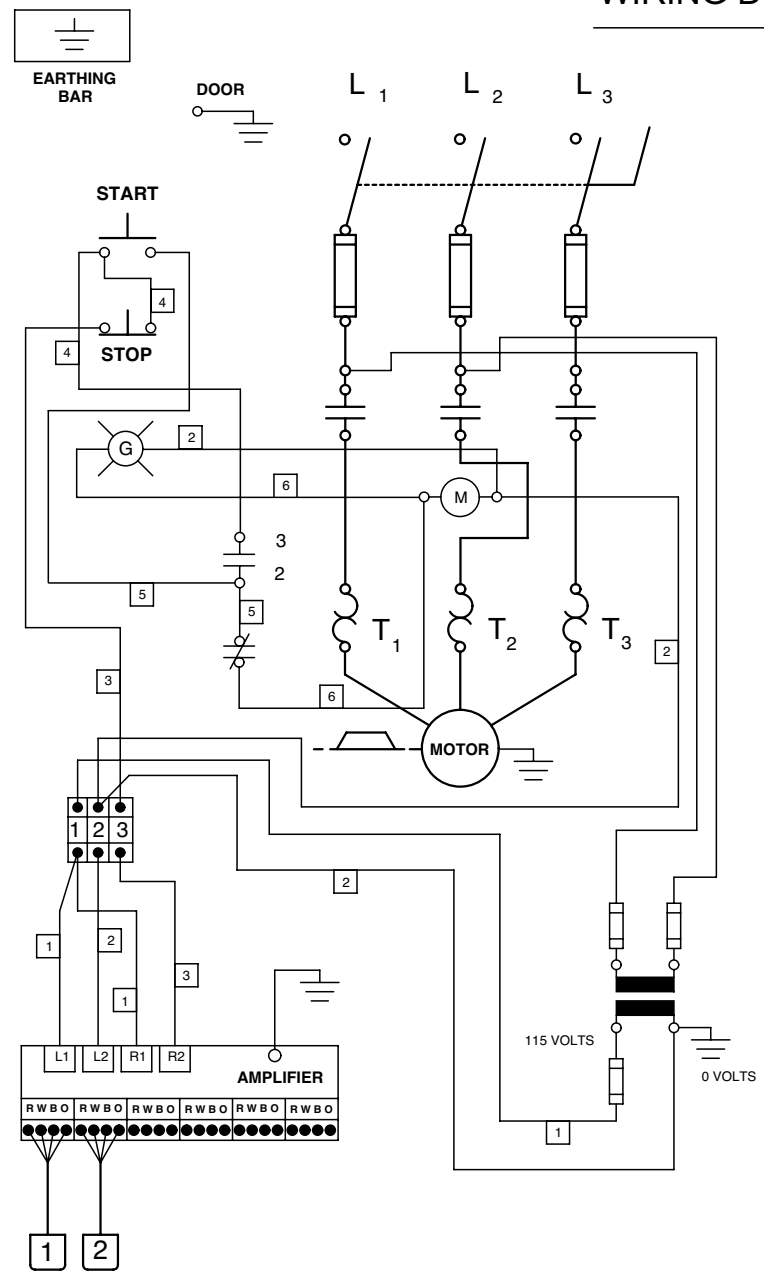
LOCATION	VOLTAGE	FUSE (FU2) PART NO.	AMPS
N. AMERICA	208 - 230	12697	1.50
	460	12692	.8
OUTSIDE N. AMERICA	200 - 208	12994	2.00
	220 - 240	12929	1.00

SWITCH LOCATIONS	
SWITCH NUMBER	LOCATION
1	FEED HOPPER ASSEMBLY
2	FRAME COVER

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

***National Electrical Manufacturers Association**

WIRING DIAGRAM 11801



MOTOR FULL LOAD AMPS	HEATER
.26 - .29	W13 12634
.30 - .32	W15 12566
.33 - .35	W16 12567
.36 - .38	W17 12568
.39 - .42	W18 12569
.43 - .46	W19 12570
.47 - .51	W20 12571
.52 - .56	W21 12572
.57 - .62	W22 12573
.63 - .68	W23 12574
.69 - .75	W24 12575
.76 - .82	W25 12576
.83 - .90	W26 12577
.91 - .99	W27 12578
1.00 - 1.09	W28 12579
1.10 - 1.20	W29 12636
1.21 - 1.32	W30 12637
1.33 - 1.45	W31 12638
1.46 - 1.59	W32 12639
1.60 - 1.75	W33 12640
1.76 - 1.93	W34
1.94 - 2.12	W35 12641
2.13 - 2.33	W36 12642
2.34 - 2.56	W37 12643
2.57 - 2.81	W38 12580
2.82 - 3.09	W39 12581
3.10 - 3.40	W40 12582
3.41 - 3.74	W41 12583
3.75 - 4.11	W42 12584
4.12 - 4.52	W43 12585
4.53 - 4.97	W44 12586
4.98 - 5.46	W45 12587
5.47 - 6.01	W46 12588
6.02 - 6.60	W47 12589
6.61 - 7.26	W48 12590
7.27 - 7.98	W49 12644
7.99 - 8.78	W50 63355
8.79 - 9.65	W51 63356
9.66 - 10.6	W52 63357
10.61 - 11.7	W53 63358
11.71 - 12.8	W54 63359
12.81 - 14.1	W55 63360
14.11 - 15.4	W56 63361
15.41 - 16.8	W57 63362
16.81 - 18.3	W58 63363
18.31 - 19.8	W59 63364
19.81 - 21.3	W60 63365
21.31 - 22.7	W61 63366
22.71 - 24.4	W62 63287
24.41 - 26.2	W63 63288

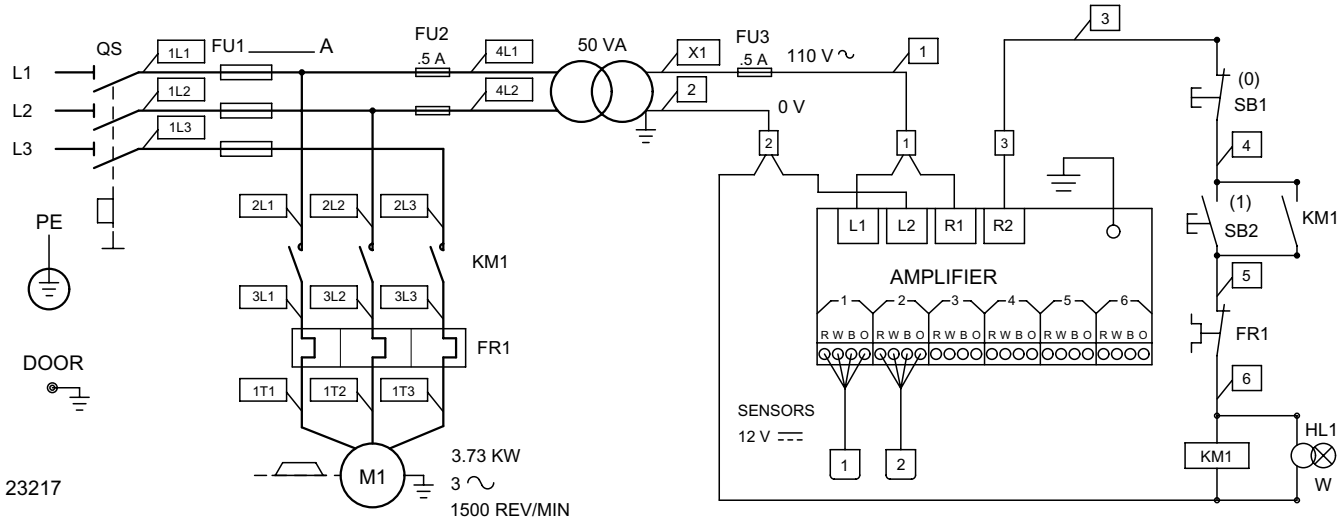
MOTOR FULL LOAD AMPS	FUSE (FU1) FRS TYPE FUSE	AMPS
4.12 - 4.52	13407	5-6/10
4.53 - 4.97	13423	6-1/4
4.98 - 5.46	13395	7
5.47 - 6.01	13400	9
6.02 - 6.60	13400	9
6.61 - 7.26	13402	10
7.27 - 7.98	13402	10
7.99 - 8.78	13402	10
8.79 - 9.65	13403	12
9.66 - 10.60	13403	12
10.61 - 11.70	13425	15
11.71 - 12.80	13425	15
12.81 - 14.10	13401	17-1/2
14.11 - 15.40	13404	20
15.41 - 16.80	13404	20

SWITCH LOCATIONS	
SWITCH NUMBER	LOCATION
1	FEED HOPPER ASSEMBLY
2	FRAME COVER

PARTS

Electrical Schematics 23217 & 23105 (CE compliant)

See the addendum for updated information



Use with 23217 schematic.

MOTOR FULL LOAD AMPS	AJT (FU1) FUSE	AMPS
1.94 - 2.12	12785	3
2.13 - 2.33	12785	3
2.34 - 2.56	12786	3
2.57 - 2.81	12786	4
2.82 - 3.09	12786	4
3.10 - 3.40	12786	4
3.41 - 3.74	12787	5
3.75 - 4.11	12787	5
4.12 - 4.52	12788	6
4.53 - 4.97	12788	6
4.98 - 5.46		
5.47 - 6.01	12789	8
6.02 - 6.60	12789	8
6.61 - 7.26	12790	10
7.27 - 7.98	12790	10
7.99 - 8.78	12970	10
8.79 - 9.65	12791	12
9.66 - 10.60	12791	12
10.61 - 11.70	12792	15
11.71 - 12.80	12792	15
12.81 - 14.10	12793	17 1/2
14.11 - 15.40	12794	20

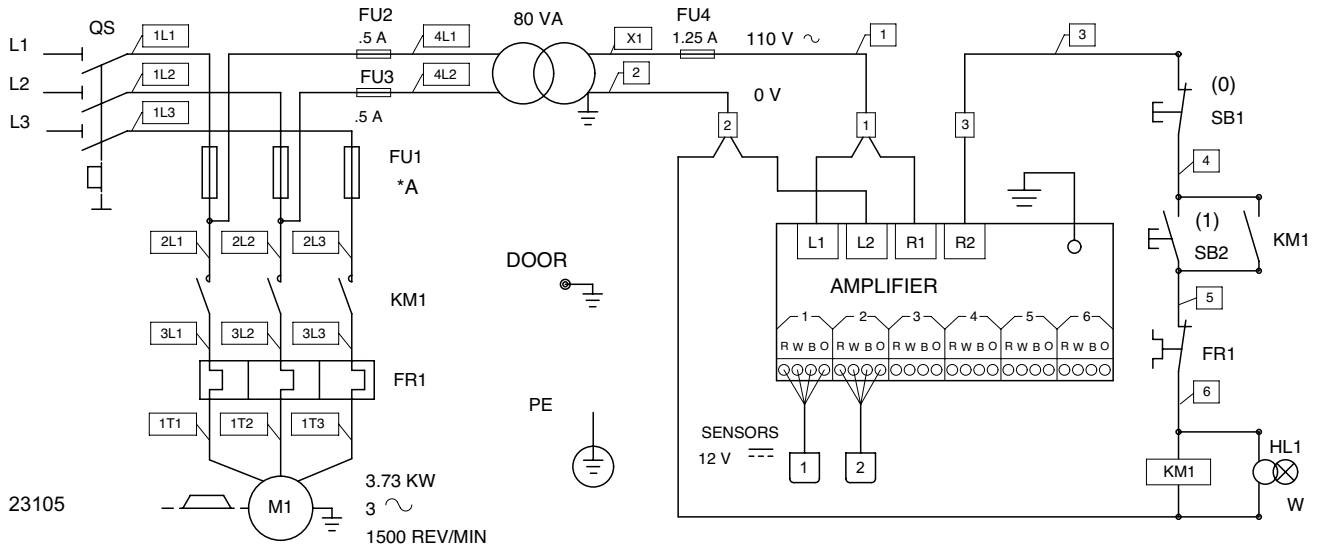
Use with 23105 schematic.

MOTOR FULL LOAD AMPS	CERAMIC TYPE FUSE (FU1) (MILK BOTTLE)		
	ADAPTER SCREW	SCREW CAP	FUSE
4.12 - 4.52	13484	13489	13475
4.53 - 4.97	13484	13489	13475
4.98 - 5.46	13484	13489	13475
5.47 - 6.01	13484	13489	13475
6.02 - 6.60	13484	13489	13475
6.61 - 7.26	13485	13489	13476
7.27 - 7.98	13485	13489	13476
7.99 - 8.78	13485	13489	13476
8.79 - 9.65	13486	13489	13477
9.66 - 10.60	13486	13489	13477
10.61 - 11.70	13487	13490	13478
11.71 - 12.80	13487	13490	13478
12.81 - 14.10	13487	13490	13478
14.11 - 15.40	13487	13490	13478
15.41 - 16.80	13487	13490	13478
16.81 - 18.30	13487	13490	13478

Use with 23217 & 23105 schematics.

OVERLOAD RELAY BLOCK	
MOTOR FULL LOAD AMPS	PART NO.
1.8 - 2.7	13679
2.5 - 4.1	13680
4.0 - 6.3	13681
5.5 - 8.5	13682
8.0 - 12.0	13683
10.0 - 16.0	13684
14.5 - 18.5	13685

SWITCH LOCATIONS	
SWITCH NUMBER	LOCATION
1	FEED HOPPER ASSEMBLY
2	FRAME COVER

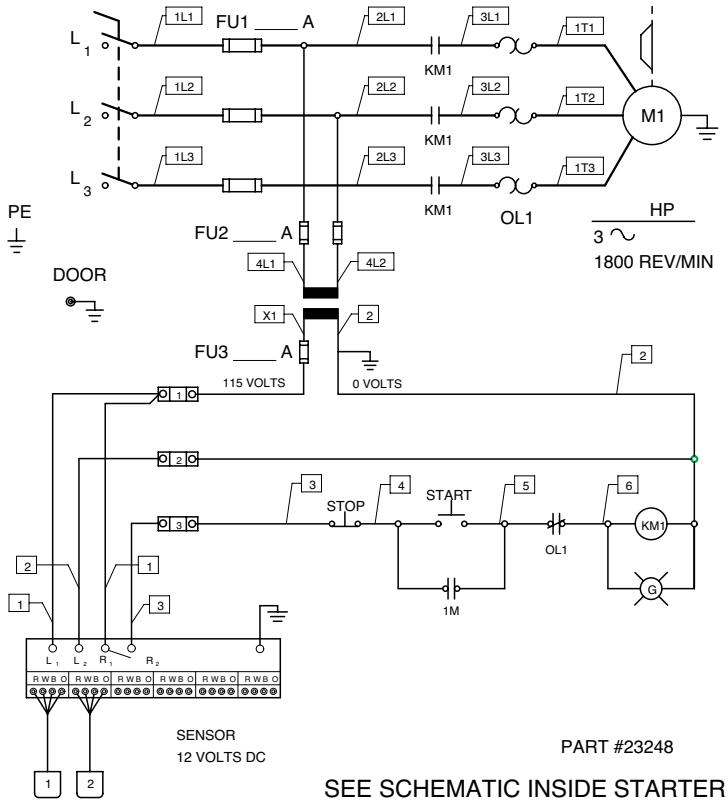


*See schematic inside starter enclosure for fuse amperage.

See the addendum for updated information

PARTS

Electrical Schematics 23248 & 23249 (7.5 & 10 H.P. motors)



PART #23248

SEE SCHEMATIC INSIDE STARTER ENCLOSURE FOR FUSE AMPERAGE

Use with 23248 & 23249 schematics.

OVERLOAD RELAY BLOCK	
MOTOR FULL LOAD AMPS	PART NO.
8.0 - 12.0	13683
10.0 - 16.0	13684
14.5 - 18.5	13685
17.5 - 22.0	13686
21.0 - 26.0	21244
25.0 - 32.0	21338

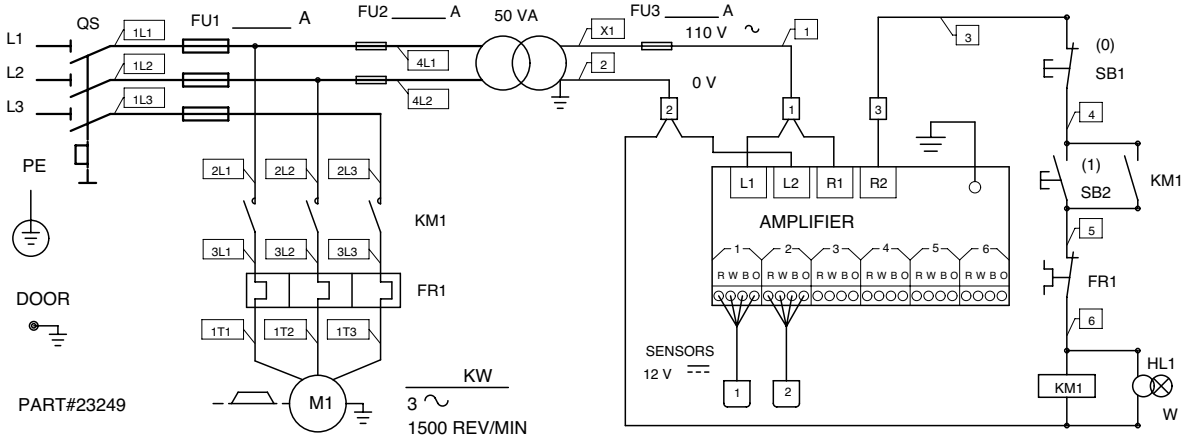
Use with 23248 & 23249 schematics.

MOTOR FULL LOAD AMPS	CUBE FUSE (FU1)	AMPS
8.10 - 11.25	21325	15
11.30 - 14.00	21326	17.5
14.10 - 16.00	21327	20
16.10 - 20.00	21328	25
20.10 - 24.00	21329	30
24.10 - 28.00	21330	35
28.10 - 32.00	21331	40
32.10 - 36.00	21332	45

Use with 23248 & 23249 schematics.

50 VA CONTROL CIRCUIT TRANSFORMER & FUSES							
WHERE USED	TRANSFORMER PART NUMBER	PRIMARY VOLTAGE	HERTZ	PRIMARY FUSE (FU2)		SECONDARY FUSE 110-120 VOLT (FU3)	
				SIZE	PART NO.	SIZE	PART NO.
N. AMERICA	12927	200-240	50/60	1.00	12925	.50	12923
OUTSIDE N. AMERICA	12927	200-240	50/60	1.00	12929	.50	12923
N. AMERICA	12927	440-480	50/60	.50	12926	.50	12923
OUTSIDE N. AMERICA	12928	380-415	50/60	.50	12924	.50	12923
N. AMERICA	21310	575	50/60	.50	12926	.50	12923

SWITCH LOCATIONS	
SWITCH NUMBER	LOCATION
1	FEED HOPPER ASSEMBLY
2	FRAME COVER

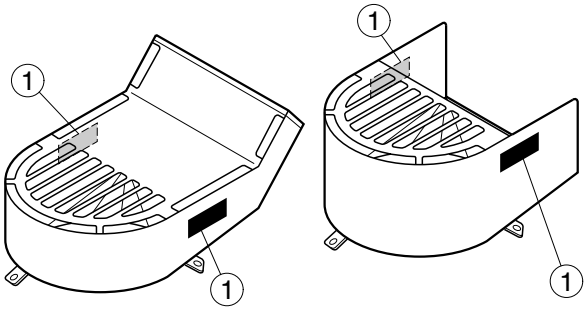


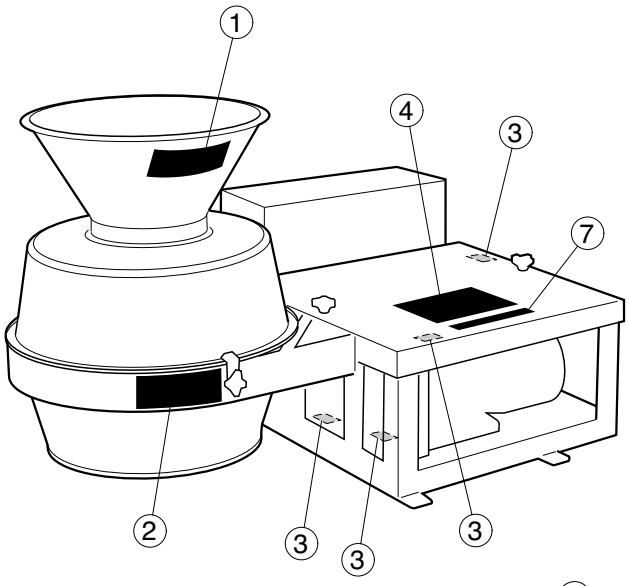
SEE SCHEMATIC INSIDE STARTER ENCLOSURE FOR FUSE AMPERAGE AND MOTOR KW

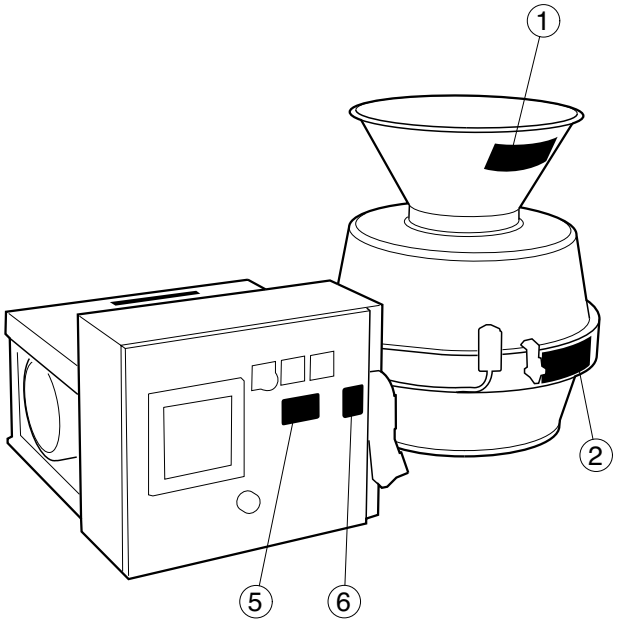
5 HP = 3.7 KW 7.5HP = 5.5 KW 10 HP = 7.5 KW

PARTS

Safety Signs and Machine Labels







1

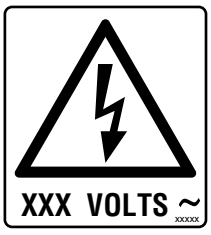
2

3

4

5

6



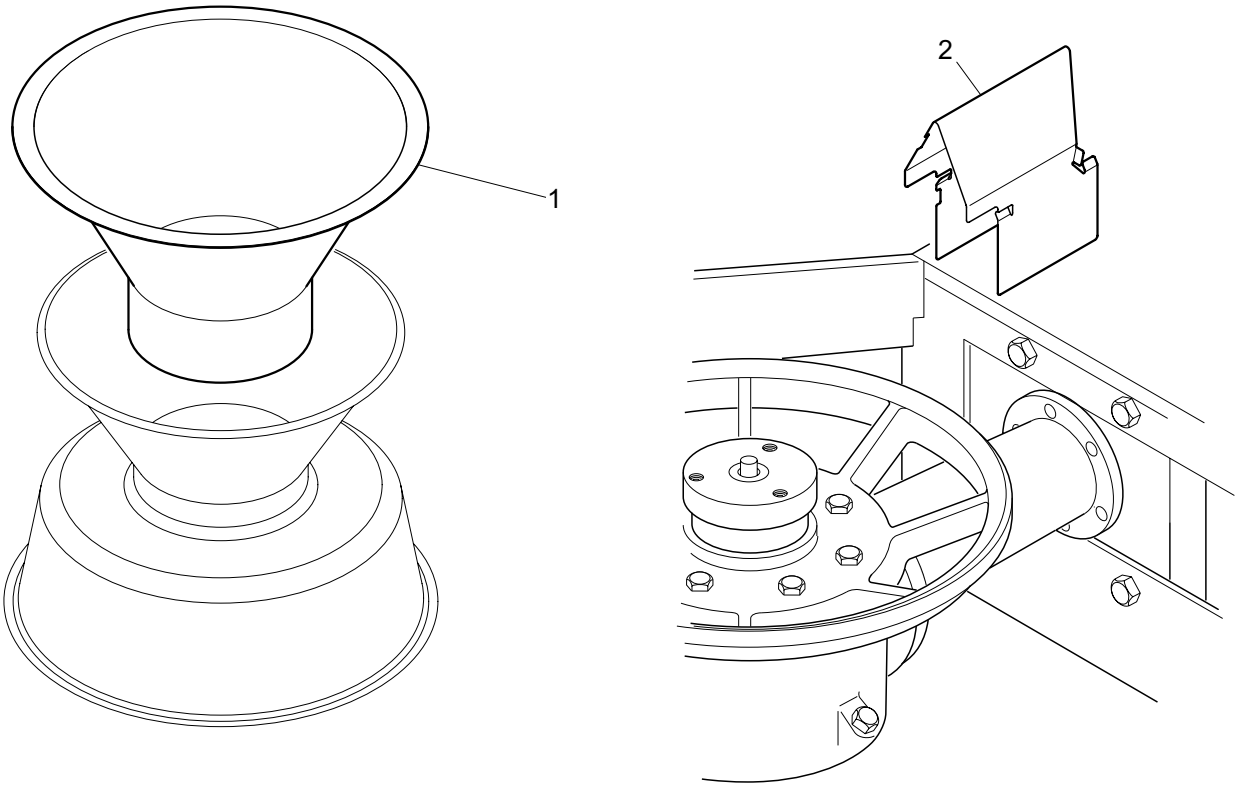
7

URSCHEL

	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
PORTUGUESE (Po)	11695	11696	11698	11699	11700
RUSSIAN (Ru)	11744	11745	11747	11748	11749
SERBO-CROATION (Sb)	11109	11110	11112	11108	11854
SPANISH	11662	11663	11665	11666	11667
SWEDISH (Sw)	11709	11710	11712	11713	11714
THAI (Th)	11946	11947	11949	11950	11951
TURKISH (Tu)	11765	11766	11768	11769	11770
QUANTITY	2*	2	4	1	1

ITEM NO.	PART NO.	DESCRIPTION	QTY.
6	12714	**Hazard Alert Label,** *electrical, 200 volts*	**
	12715	**Hazard Alert Label,** *electrical, 208 volts*	
	12716	**Hazard Alert Label,** *electrical, 220 volts*	
	12717	**Hazard Alert Label,** *electrical, 230 volts*	
	12718	**Hazard Alert Label,** *electrical, 240 volts*	
	12719	**Hazard Alert Label,** *electrical, 380 volts*	
	12720	**Hazard Alert Label,** *electrical, 400 volts*	
	12721	**Hazard Alert Label,** *electrical, 415 volts*	
	12723	**Hazard Alert Label,** *electrical, 460 volts*	
	12724	**Hazard Alert Label,** *electrical, 575 volts*	
7	11326	**Urschel Label**	1

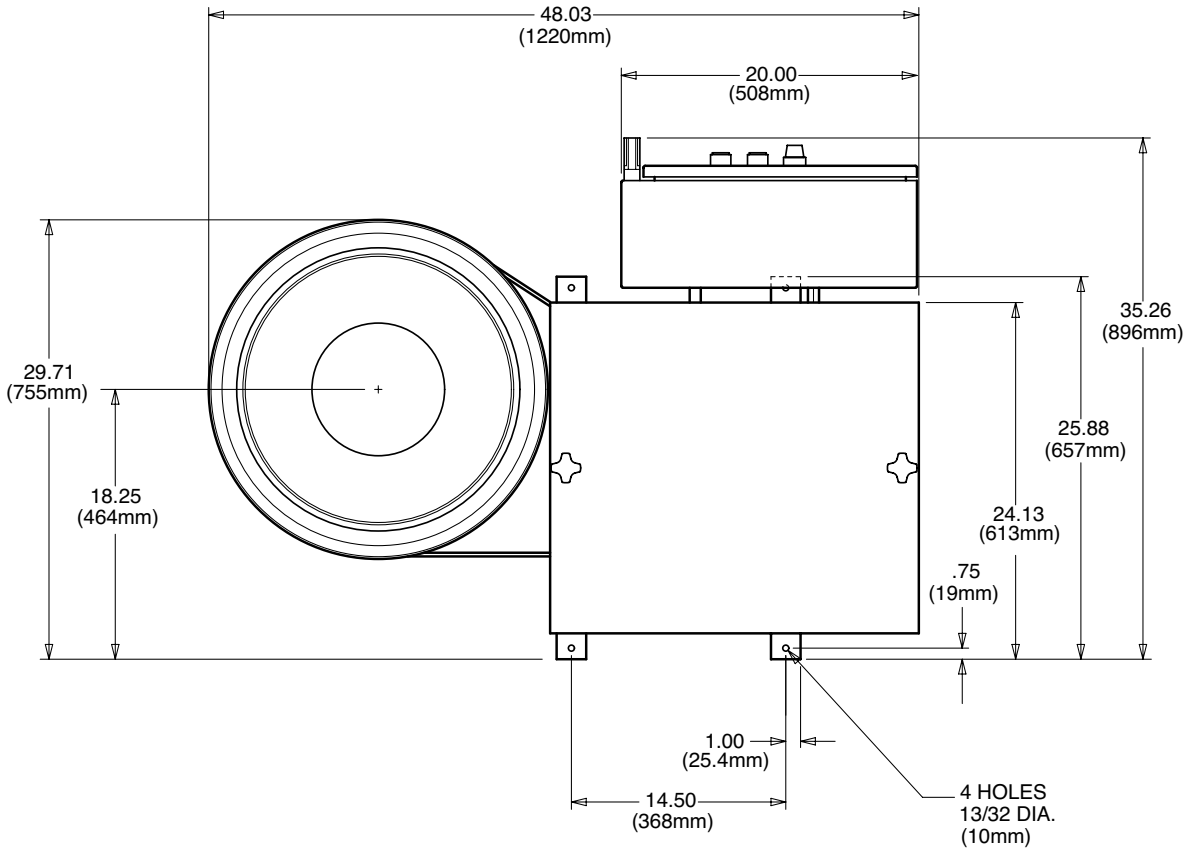
* Machine with funnel hopper extension uses four of item 1.
** One Hazard Alert Label supplied with the machine.

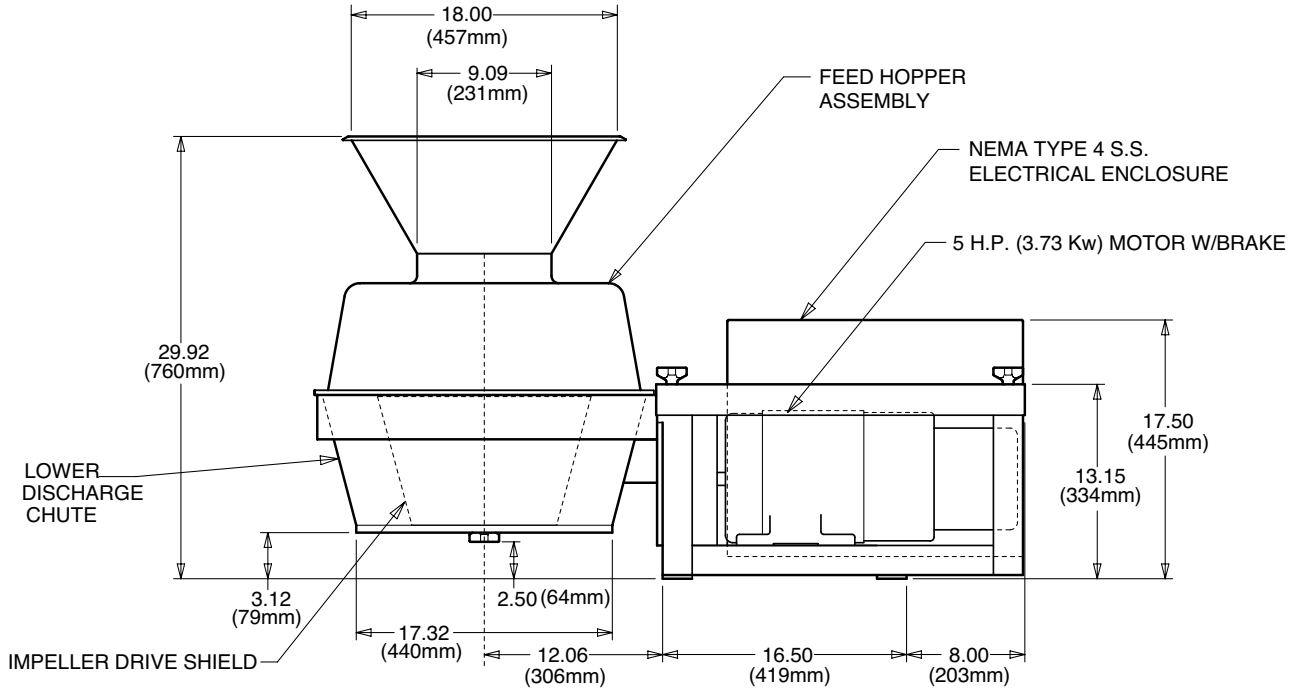

1
2

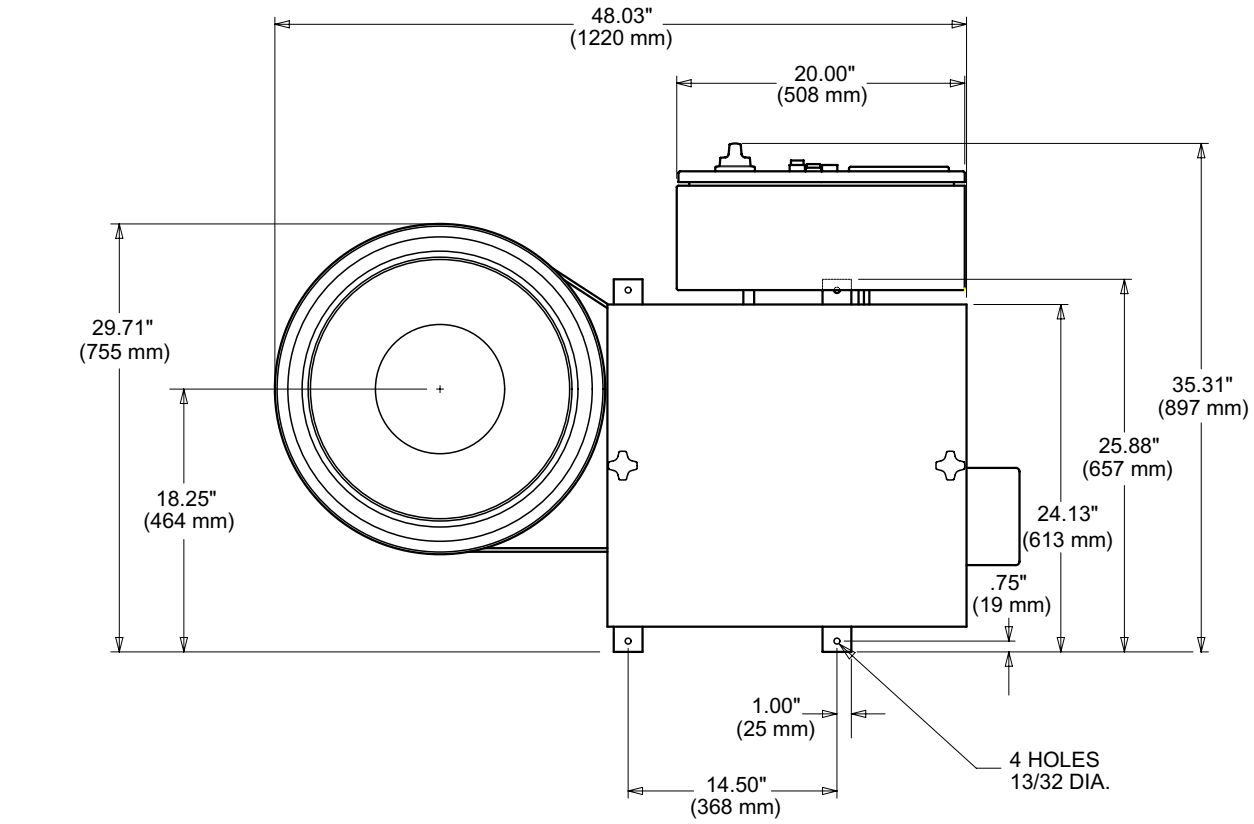
ITEM NO.	PART NO.	DESCRIPTION	APPLICATION
1	22987	**Feed Hopper Insert,** *CC-D*	Used to help direct and contain product in the impeller
2	23165	**Product Deflector,** *CC-D*	Used to help prevent product from accumulating on the horizontal bearing housing

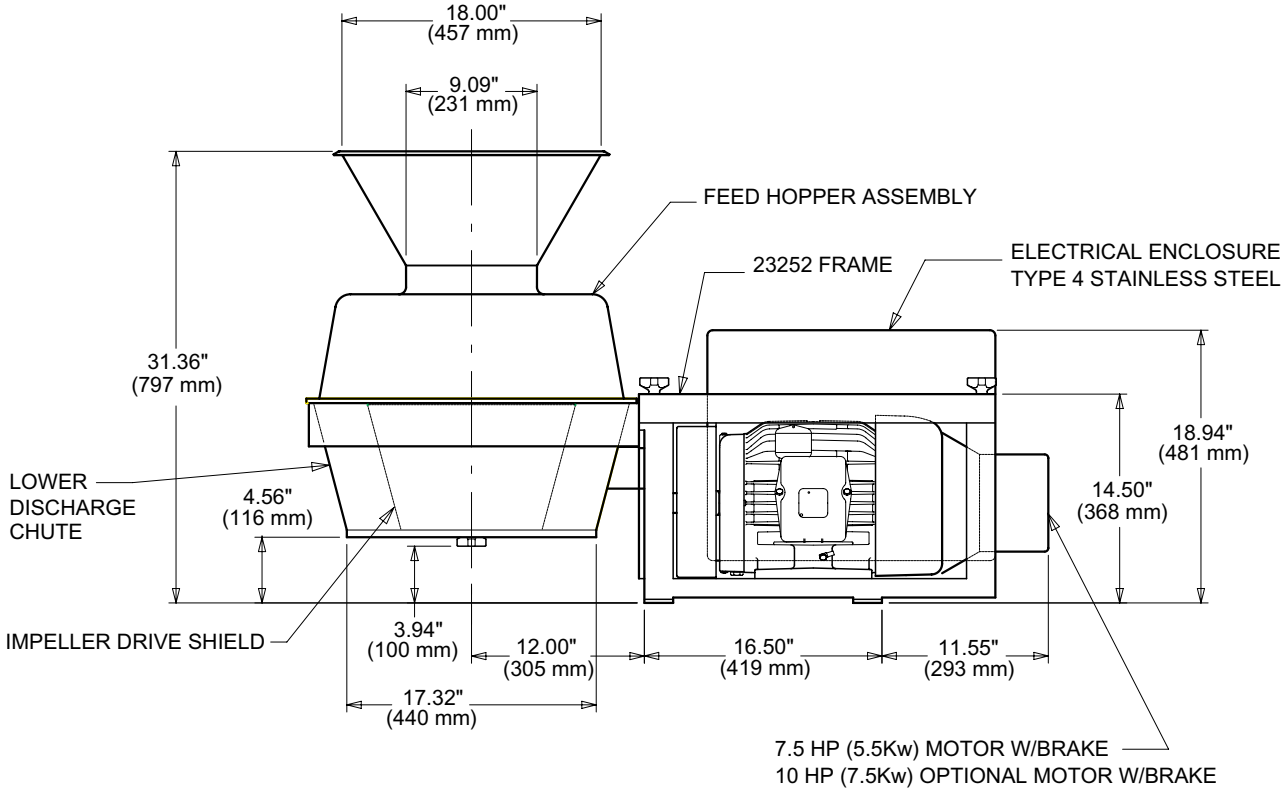
PARTS

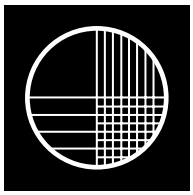
Dimensional Drawing, 5 H.P. Motor






48.03"
(1220 mm)
20.00"
(508 mm)
29.71"
(755 mm)
18.25"
(464 mm)
35.31"
(897 mm)
25.88"
(657 mm)
24.13"
(613 mm)
.75"
(19 mm)
1.00"
(25 mm)
14.50"
(368 mm)
4 HOLES
13/32 DIA.


18.00"
(457 mm)
9.09"
(231 mm)
FEED HOPPER ASSEMBLY
23252 FRAME
ELECTRICAL ENCLOSURE
TYPE 4 STAINLESS STEEL
31.36"
(797 mm)
18.94"
(481 mm)
14.50"
(368 mm)
LOWER
DISCHARGE
CHUTE
4.56"
(116 mm)
IMPELLER DRIVE SHIELD
3.94"
(100 mm)
12.00"
(305 mm)
16.50"
(419 mm)
11.55"
(293 mm)
17.32"
(440 mm)
7.5 HP (5.5Kw) MOTOR W/BRAKE
10 HP (7.5Kw) OPTIONAL MOTOR W/BRAKE



URSCHEL

LABORATORIES INCORPORATED

Designers and manufacturers of precision size reduction equipment.

CORPORATE HEADQUARTERS
1200 Cutting Edge Drive
Chesterton, Indiana 46304 U.S.A.
Corporate: +1.219.464.4811 Fax: +1.219.462.3879
Toll Free: +1.844.URSCHEL (877.2435)
www.urschel.com
Technical Publication inquiries: techpubs@urschel.com
Other inquiries: info@urschel.com

With subsidiaries and sales offices in principal cities worldwide.

1798 NOV 02
(s.s. 1471)