URSCHEL MODEL HX-A

Instruction Manual

Index

CAUTION

THE SAFETY AND OPERATION SECTIONS OF THIS MANUAL MUST BE READ BY/OR TO EACH PERSON BEFORE THAT PERSON OPERATES, CLEANS, REPAIRS, ADJUSTS, SUPERVISES THE OPERATION OF, OR USES THIS MACHINE IN ANY WAY.

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February, 1995

(rev. July 02)

The attached eight-page supplement applies only to machines built and shipped after February 6, 1995. This information replaces or is in addition to the existing information as it appears in this manual.

SPECIFICATIONS

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

PRODUCT LIMITATIONS

PRODUCTS WHICH ARE EXPLOSIVE or create a potentially explosive atmosphere should not be processed by this machine.

LOCATION

Choose a location that provides machine stability, ample space, and a clear path on all sides of the machine. Provide easy access to the stop/start controls and the main power disconnect switch on the starter enclosure, and also allow room for cleaning and maintenance. The location should also 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 at floor level. If elevating the machine is necessary, make provisions to maintain all operation, cleaning, maintenance and safety features of a floor level installation.

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 and manganese aluminum bronze alloy. Excessive solution strength and soaking time or excessive soaking time alone may chemically harm or destroy these and other materials.

OPERATION
Installation

ELECTRICAL POWER

The electrical installation must be performed by a qualified electrician in accordance with all applicable electrical codes. Refer to Figure 1, page 3 and proceed as follows:

1. **Connect the outside power source** to the terminals on top of the disconnect in the starter enclosure. Voltage label on the front of the starter enclosure specifies proper voltage for this machine. 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: If voltage is not at least 95% of specified voltage, the motor may become overloaded during operation.

2. **Connect ground conductor** (green or green and yellow striped wire) to the earth termination point located on back panel inside the starter enclosure.

3. **Connect the wiring** so that the motor rotates in the proper direction (consult the instruction manual).

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

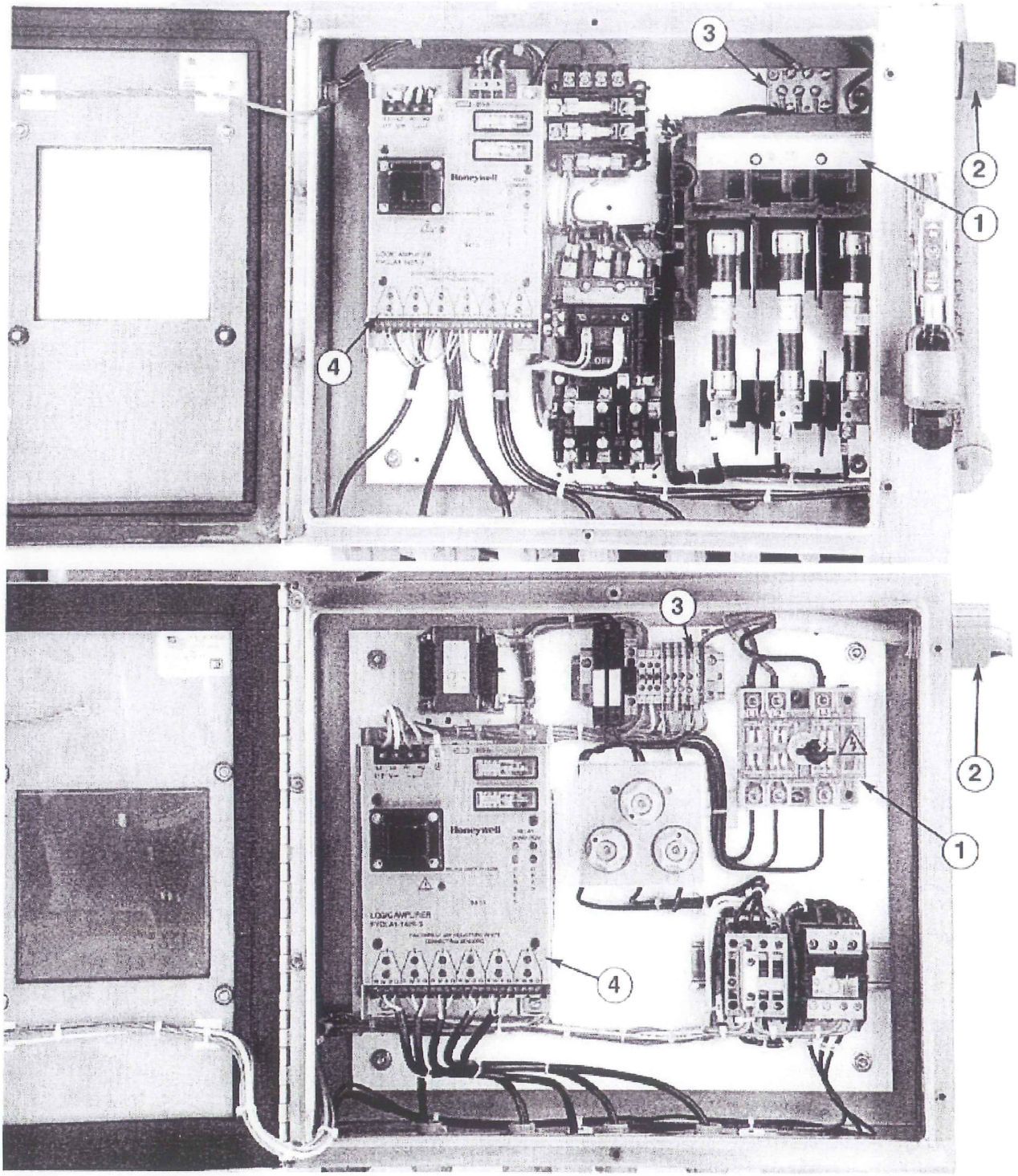


Figure 1 — Interior of starter enclosure (NEMA* configuration, top, and IEC** configuration, bottom). (1) Disconnect, (2) Power Source Entry Point, (3) Earth Termination Point, (4) Amplifier

* National Electrical Manufacturers Association
** International Electrical Commission

OPERATION

Safety Switches

The electrical system has prewired safety switches on certain covers and guards to prevent the machine from operating when these covers or guards are removed.

⚠ WARNING: **Before operating the machine, a qualified trained person should check the safety switches by the following procedure. Be careful to avoid contact with cutting parts and sharp edges exposed during these tests!**

AMPLIFIER

The amplifier, viewed through the starter enclosure window, indicates the condition of the safety switch circuits (see Figure 2, page 5). When the green "relay condition" LEDs are illuminated, all circuits are closed and machine is ready for operation.

When one or both of the red "relay condition" LEDs are illuminated, one of the safety switches is creating an open circuit. The illuminated red "switch output" LEDs will indicate the problem source.

When the red "attention" LED is flashing and all sensors and actuators are within specified sensing distance, 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 7).

SAFETY SWITCH TEST

⚠ WARNING: **There is a problem in the safety switch circuit if the LEDs are not lit as indicated or if, having removed a cover or guard equipped with switch, the machine can be started. DO NOT operate the machine in this condition! Call a qualified electrician to locate and repair the fault immediately. See "Inspection", page 6.**

1. **With all covers and guards in place,** turn the power disconnect switch to "I" (ON). Only the green "relay condition" LEDs on the amplifier should be lit. Turn power disconnect switch to "O" (OFF).

2. **Remove one cover or guard equipped with switch.** Turn power disconnect switch to "I" (ON). Only the red "relay condition" LEDs and the red "switch output" LEDs corresponding to the switch on the removed cover 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 switch to "O" (OFF)** and replace the cover or guard.

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

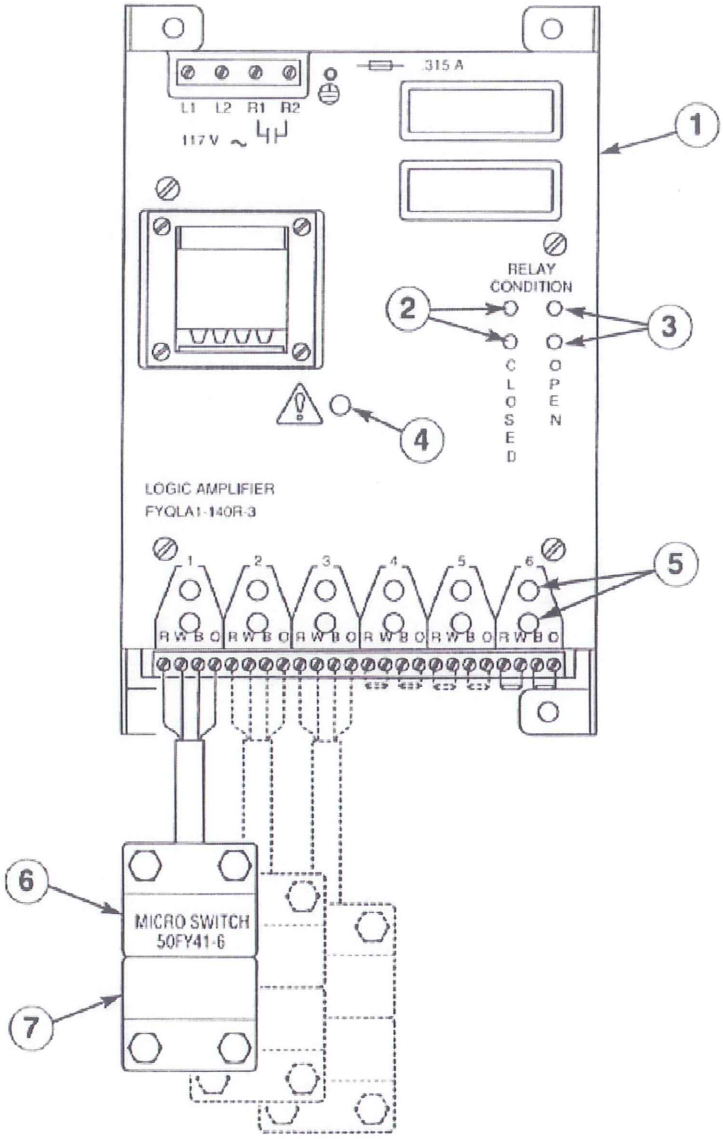


Figure 2 — Amplifier and switches. (1) Amplifier, (2) Green "Relay Condition" LEDs, (3) Red "Relay Condition" LEDs, (4) Red "Attention" LED, (5) Red "Switch Output" LEDs, (6) Sensor, (7) Actuator.

MAINTENANCE
Electrical Assembly

INSPECTION

⚠ WARNING: In the event of an electrical problem, only a qualified electrician should inspect or repair the fault. Always disconnect and lock out power source 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 page 4. Electrical schematics are located in the starter enclosure and in the instruction manual. Refer to Figures 3 or 4 and inspect the following items in the electrical assembly:

Starter enclosure: Inspect interior of starter enclosure for moisture and corrosion. Check gasket around door and window. Breather drain should be free from obstruction. Inspect stop and start push button assemblies and pilot light assembly for damage or corrosion. Replace rubber boots and pilot light lens if damaged.

Fuses: 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. Remove and inspect amplifier fuses (Figure 5, page 7). Replace if necessary.

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.

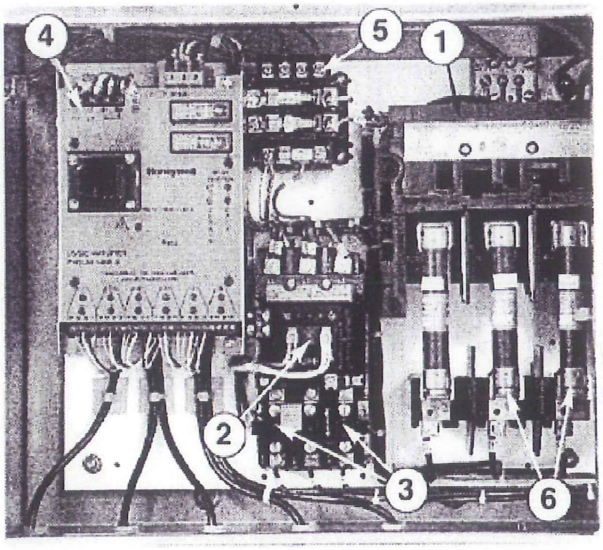


Figure 3 — Typical starter enclosure interior (NEMA). (1) Disconnect, (2) Starter Coil, (3) Heaters, (4) Amplifier, (5) Transformer, (6) Main Fuses.

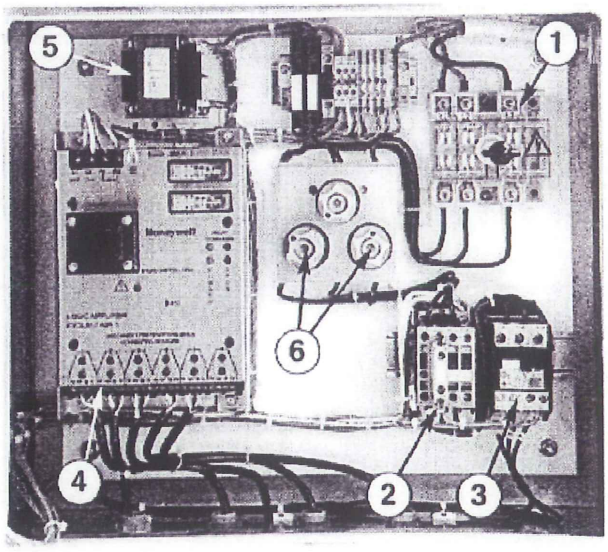


Figure 4 — Typical starter enclosure interior (IEC). (1) Disconnect, (2) Contactor, (3) Overload Block, (4) Amplifier, (5) Transformer, (6) Main Fuses.

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

Overload Block (IEC enclosure): If overload block has been tripped several times, it may fail to reset and must be replaced. Check for proper motor current draw if overload block continues to trip.

Amplifier:

⚠ WARNING: The amplifier must be properly wired to function correctly. Consult the manufacturer's literature for complete wiring instructions.

The amplifier and the switches incorporate self-diagnostic features to help identify the source of problems. The LEDs on the amplifier (Figure 5) will indicate the status of the system:

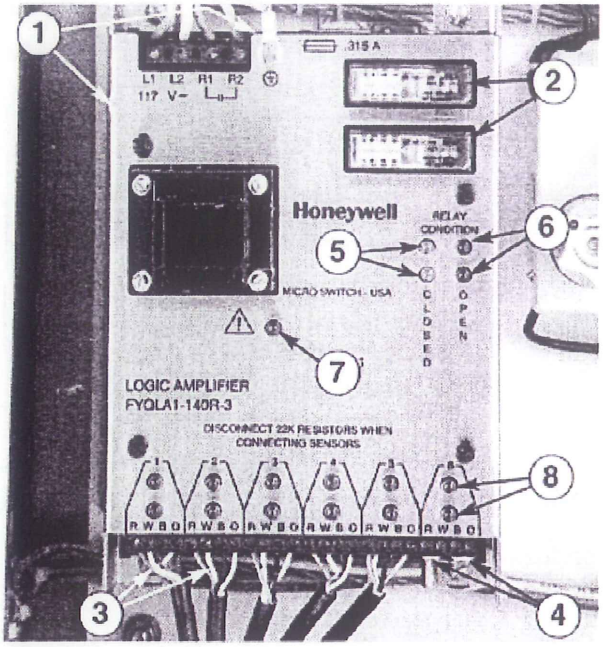


Figure 5 — Amplifier. (1) Fuses, (2) Relays, (3) Sensor Leads, (4) Resistors, (5) Green "Relay Condition" LEDs, (6) Red "Relay Condition" LEDs, (7) Red "Attention" LED, (8) Red "Switch Output" LEDs.

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

Red "relay condition" LEDs and any of the red "switch output" LEDs are illuminated: the circuit for the sensor assigned to that location is open. If the sensor and actuator are aligned and within specified sensing distance, the sensor or resistor has failed and must be replaced.

Both red "relay condition" LEDs are illuminated and the red "attention" LED is flashing: the amplifier has detected a fault. Inspect the condition and placement of sensor leads and resistors. Terminals should be tight and free from corrosion. With sensors and actuators aligned and within specified sensing distance, reset the system by turning the power disconnect switch to "O" (OFF) and then turning the power disconnect back to "I" (ON). If all items are in good condition and red "attention" LED is still flashing, the amplifier has failed and must be replaced.

⚠ WARNING: Always perform the pre-start safety switch test before operating the machine. See "Safety Switches", page 4.

MAINTENANCE
Electrical Assembly

Safety switches: Check sensors, actuators and cords for damage. Switches should be replaced if any defect or damage is detected. Check switch alignment. Actuator must be within 1/16" (1.6 mm) of sensor to complete safety switch circuit (Figure 6).

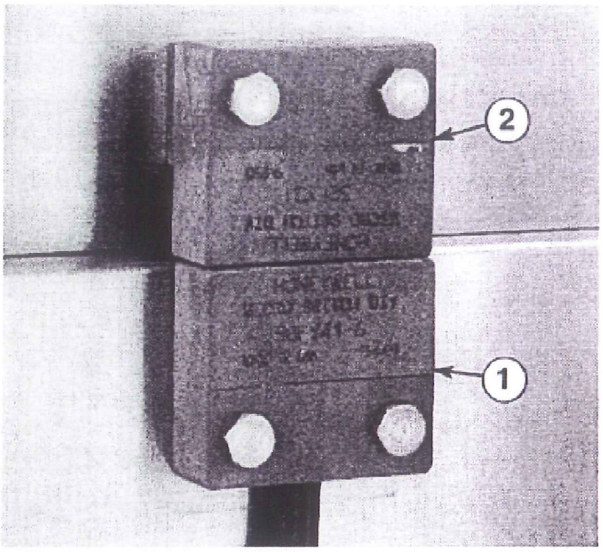


Figure 6 — Safety switch sensors and actuators must be aligned and within 1/16" (1.6 mm). (1) Sensor, (2) Actuator.

November 1, 2000

MODEL HX-A
(648 JUN 71)

The following revisions apply to this manual:

Enclosed is 5 page Operation and Maintenance updated information.
Also enclosed Machine Labels pages show new machine labels and their locations.

Page 5 — The **lubricant** recommended for this machine has changed. See attached 2-page important notice at the end of this addendum

Page 12 — Under "Drive Gears, Hubs and Fasteners", part no. 10020 should read **10230**.

Page 13 — Feed Roll Photo is Obsolete

Page 14 — Under "Feed Roll Assembly" note the following part no. changes:
Omit part no. 28566 and its description
Omit part no. 16107 and its description
Omit part no. 44013 and its description
Omit part no. 16121 and its description
Part no. 16004 should read **16390**

Page 15 — Under "Conveyor Assembly and Feed Belt"note the following changes:
Part Nos. 10021 (appearing twice) should read **10306 —Hex nut, locking, 5/16-18**

Also part no. 10021 appearing in the description for part no. 27086 should read **10306**

Pages 16&17 — Under "Cross Cut Spindles and Parts", note the following part no. changes:
Part No. 28544 should read **28653** (two instances)
Part No. 28545 should read **28654**
Part No. 28546 should read **28655**
Part No. 28587 should read **28656** (two instances)
Part No. 28591 should read **28658** (two instances)
Part No. 28592 should read **28659**
Add part no. **28671**, Spindle for 3/4" cut
Add part no. **15379**, Spindle for 3/4" cut, with crank pin and idler pin bearing 15047
Add part no. **15380**, Eccentric bearing plate with 10 holes
Part No. 28593 should read **28657**
Part No. 28584 should read **28660** (two instances)
Part No. 28593 should read **28657**
Part No. 15036 should read **15298**
Part No. 28545 should read **28654**
Part No. 15040 should read **15307**
Part No. 28655 should read **28658**
Part No. 15269 should read **15311**
Part No. 15041 should read **15303** (two instances - once in photo)
Part No. 15042 should read **15304** (two instances - once in photo)

continued on next page

Pages 18&19 Under "Circular Knife Spindles and Parts", note the following part no. changes:

Part No. 28596 should read **28661**
Part No. 28597 should read **28662**
Part No. 28598 should read **28663**
Part No. 28599 should read **28664**
Part No. 28600 should read **28665**
Part No. 28601 should read **28666**
Part No. 28602 should read **28667**
Part No. 28603 should read **28668**
Part No. 28604 should read **28669**
Part No. 15057 should read **15306**

Page 18 Photo changes:

Feed roll photo obsolete
Part No. 28566 should read **28606**

Page 19 Under "Cutting Plates", note the following part no. changes:
Omit Part No. 10057 and its description
Add Part No. **28241**, Cutting Plate with 5/16" slots
Add Part No. **28194**, Cutting Plate with 5/8" slots
Add Part No. **28155**, Cutting Plate with 3/4" slots

Page 19 Under "Frame and Motor", note the following part no. changes:
Omit Part No. 28014 and consult factory on Frame part no. when needed
Omit Part No. 12409 and consult factory on Motor part no. when needed
Part No. 10060 should read **10059**
Part No. 10022 should read **10249**

Page 19 Under "Discharge Chute, Guards and Fasteners, note the following part no. changes:

Part No. 28515 should read **28068**
Part No. 28517 should read **28625**
Part No. 28214 should read **62052**
Part No. 10214 should read **10251**
Add Part No. **28612**, Slice Guide, right, one required
Add Part No. **28613**, Slice Guide, left, one required
Add Part No. **17390**, Spindle Screw, two required

Page 20 Under "Accessories", note the following part no. changes:
Add Part No. **11032**, 7/16" Socket

Page 20 The parts below have been added :

Tools & Spare Parts List

11070	1	Grease Gun
11045	2	Grease Cartridge
11071	1	Tool Box

Also see attached supplement dated January, 1990.

Also see attached February, 1998 Electrical Assemblies and Stearns 56200 brake assembly addendums.

The electrical system has prewired safety switches on certain covers and guards to prevent the machine from operating when these covers or guards are removed.

⚠ **WARNING:** ***Before operating the machine, a qualified trained person should check the safety switches by the following procedure. Be careful to avoid contact with cutting parts and sharp edges exposed during these tests!***

The control monitor (Figure 1), viewed through the starter enclosure window, indicates the condition of the safety switch circuits. A green light at location 8 means that all circuits are closed and machine is ready for operation. A red light at location 7 indicates one of the safety switches is creating an open circuit. The lower bank of red lights will indicate the problem source.

SAFETY SWITCH TEST

⚠ **WARNING:** ***There is a problem in the safety switch circuit if the lights are not lit as indicated or if the machine starts with any cover or guard equipped with switch removed. DO NOT operate the machine in this condition! Call a qualified electrician to locate and repair the fault immediately.***

1. **With all covers and guards in place,** turn the power disconnect switch to "ON" (I). Only the green light at location 8 on the control monitor should be lit. Turn power disconnect switch to "OFF" (O).
2. **Remove one cover or guard equipped with switch.** Turn power disconnect switch "ON" (I). Only location 7 and the light corresponding to the switch on the removed cover should be lit on the control monitor. If lights are lit correctly, push the "START" (I) 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 "STOP" (O) button; then **disconnect and lock out power source.** Call a qualified electrician to locate and repair the fault immediately).
3. **Turn the power disconnect switch "OFF" (O)** and replace the cover or guard.
4. **Individually remove each additional cover or guard equipped with switch** and repeat steps 2 and 3. Make sure all covers and guards are securely in place after all switches have been tested.

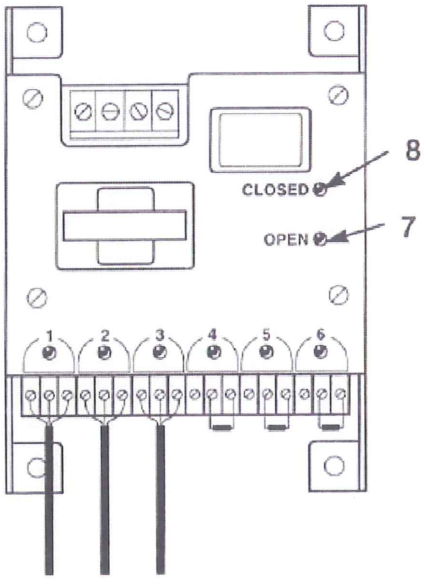


Figure 1 — Control Monitor

OPERATION

Start-up and Stopping

PRE-START CHECKLIST

After all requirements in this checklist have been met, the machine is ready for operation.

1. **Safety:** All operators must have a thorough understanding of the safe operation of this machine.

2. **Location:** Machine must have ample space on all sides so that operators can move safely and easily in a clean, dry work area.

3. **Electrical power:** Machine must be properly wired and the starter enclosure door screws securely fastened.

4. **Safety switches:** Switches must be in working order with guards securely in place.

START-UP PROCEDURE

1. **Make sure all foreign objects and product** have been removed from the feed area.

2. **Unlock power disconnect switch.**

3. **Move lever to "ON" (I).**

4. **Press "START" (I) button.**

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

STOPPING PROCEDURE

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

2. **Flush the feed area thoroughly** with a generous amount of water BEFORE stopping the machine. See manual for further cleaning instructions.

3. **Push "STOP" (O) button** then disconnect and lock out power source.

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.

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!***

1. **Push "STOP" button then disconnect and lock out power source.**
2. **Only qualified trained personnel should proceed to step 3.**
3. **Remove guards** from jammed area and visually verify that all parts have stopped.
5. **Remove the obstruction.** ***Keep hands away from cutting parts.***
6. **Remove all product from the feed area** and replace all covers and guards.
7. **Machine is ready to restart** and resume feeding product. If fed properly, product will flow evenly into feed areas.

⚠ **CAUTION:** ***If product continues to jam in the feed or discharge areas, DO NOT operate the machine. Contact your supervisor.***

MAINTENANCE
Electrical Assembly

INSPECTION

⚠ WARNING: ***In the event of an electrical problem, only a qualified electrician should inspect or repair the fault. Always disconnect and lock out power source before beginning electrical inspection or repair.***

The electrical assembly must be in good working condition before operating this machine. For a description of control monitor and safety switch operation and method for checking this system, see "Safety Switches". Refer to Figure 2 and inspect the following items in the electrical assembly:

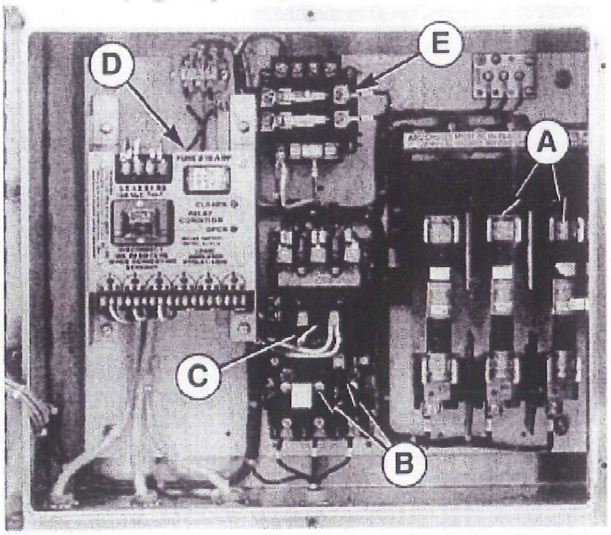


Figure 2 — Typical starter enclosure interior (A) Main Fuses, (B) Heaters, (C) Starter Coil, (D) Control Monitor, (E) Transformer

Starter enclosure: Inspect interior of starter enclosure for moisture and corrosion. Check gasket around door and window. Breather drain should be free from obstruction. Inspect stop and start push button assemblies and pilot light assembly for damage or corrosion. Replace rubber boots and pilot light lens if damaged.

Fuses: 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. Remove and inspect control monitor fuse. (See Figure 3, page 5) Replace if necessary.

Heaters (thermal overloads): If heaters 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: Disconnect leads from coil at front of motor starter and check with an ohmmeter. Replace if necessary.

Safety switches: Check sensors, actuators and cords for damage. *Switches should be replaced if any defect or damage is detected.* Check switch alignment. Actuator must be within 1/16" of sensor to complete safety switch circuit.

Control monitor: Remove relay (Figure 3). Inspect contacts and clean if corroded. A spare relay should be kept on hand for replacement. Inspect sensor leads and resistors. Terminals should be tight and free from corrosion.

If all items are in good condition and machine will not start, there may be a problem in the control monitor or safety switches. If the open circuit light and one or more location lights are lit on control monitor, note light locations and proceed as follows:

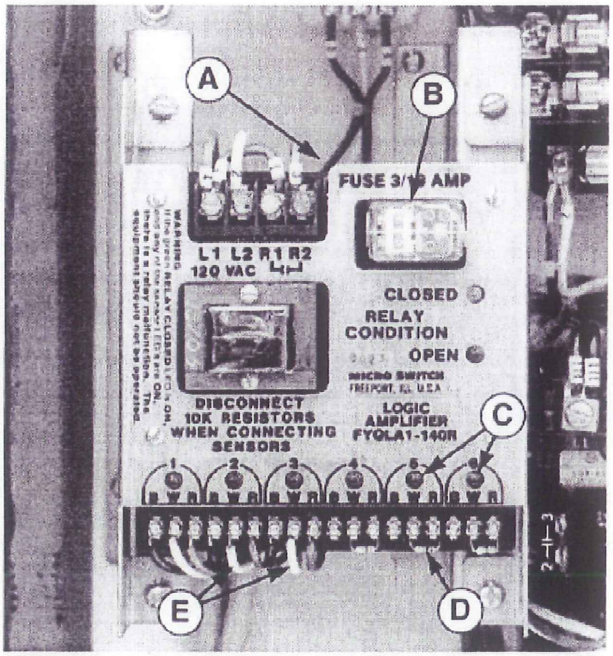


Figure 3 — Control monitor (A) Fuse (under cap), (B) Relay, (C) Light Locations, (D) Resistor, (E) Sensor Leads

Control Monitor Check:

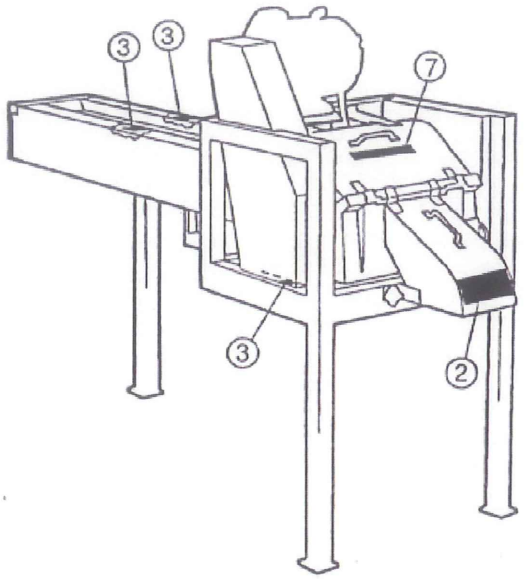
1. **Disconnect and lock out power source.**

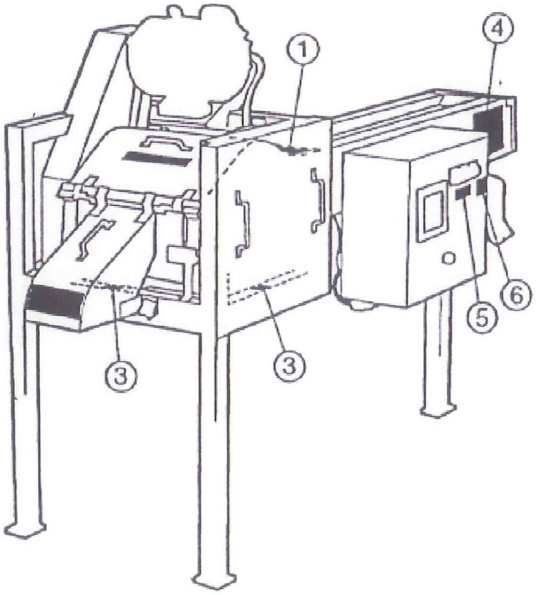
2. **Disconnect sensor lead** at the light location that was lit on control monitor. Disconnect another sensor lead from a light location that was *not* lit. Switch positions and reattach to monitor. For example, if light at location one was lit and light at location three was not, attach sensor lead from location one at location three and sensor lead from location three at location one.

3. **Turn on power source.** If light appears at original location on control monitor, control monitor is probably defective and should be replaced. If light appears at relocated sensor lead position, safety switch is probably defective and should be replaced.

NOTE: *An exchange program is available should the control monitor need replacement; contact Urschel Laboratories, Inc. for complete information.*

Machine Labels (HX-A, GX-A)





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CAUTION

MACHINE CONTAINS ROTATING PARTS SUCH AS SHARP KNIVES, PULLEYS, BELTS OR GEARS.
NEVER RUN MACHINE WITH ANY GUARD OR COVER REMOVED, EVEN FOR CLEANING.
TURN THE MACHINE OFF, DISCONNECT AND LOCK OUT POWER SOURCE BEFORE ATTEMPTING TO SERVICE OR REMOVE OBSTRUCTION.
RUNNING MACHINE WITH ANY GUARD OR COVER REMOVED MAY RESULT IN SERIOUS INJURY OR AMPUTATION.
READ AND UNDERSTAND INSTRUCTION MANUAL.

PRECAUCION

LA MAQUINA CONTIENE PIEZAS GIRATORIAS TALES COMO CUCHILLAS AFILADAS, POLEAS, CORREAS O ENGRANAJES.
NUNCA HACER FUNCIONAR LA MAQUINA CON CUALQUIERA DE LOS PROTECTORES O CUBIERTAS RETIRADOS, INCLUSO PARA LIMPIARLA.
APAGAR LA MAQUINA, DESCONECTAR Y BLOQUEAR EL SUMINISTRO ELECTRICO ANTES DE INTENTAR HACER UNA REPARACION O QUITAR UNA OBSTRUCCION.
SE CORRE EL RIESGO DE SUFRIR GRAVES LESIONES O AMPUTACION SI SE HACE FUNCIONAR LA MAQUINA CON CUALQUIERA DE LOS PROTECTORES O CUBIERTAS FUERA DE SU LUGAR.
LEER Y ENTENDER EL MANUAL DE INSTRUCCIONES.

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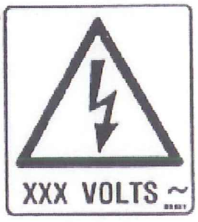
⑥ 

⑦ URSCHEL

	①	②	③	④	⑤	⑥	⑦
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ESPAÑOL	11662	11663	11665	11666	11667	*	11326
FRANÇAIS (F)	11674	11675	11677	11678	11679	*	11326
DEUTSCH (Ge)	11681	11682	11684	11685	11686	*	11326
日本語 (J)	11688	11689	11691	11692	11693	*	11326
PORTUGUÊS (Po)	11695	11696	11698	11699	11700	*	11326
ITALIANO (It)	11702	11703	11705	11706	11707	*	11326
SVENSKA (Sw)	11709	11710	11712	11713	11714	*	11326
NEDERLANDS (Du)	11716	11717	11719	11720	11721	*	11326
中文 (Ch)	11724	11725	11727	11723	11728	*	11326
POLSKI (Pol)	11730	11731	11733	11734	11735	*	11326
ΕΛΛΗΝΙΚΗ (Gr)	11737	11738	11740	11741	11742	*	11326
SRPSKO-HRVATSKI (Sb)	11109	11110	11112	11108	11667	*	11326
РУССКИЙ (Ru)	11744	11745	11747	11748	11749	*	11326
BAHASA INDONESIA (In)	11751	11752	11754	11755	11756	*	11326
SUOMI (Fi)	11758	11759	11761	11762	11763	*	11326
TÜRKÇE (Tu)	11765	11766	11768	11769	11770	*	11326
MAGYAR (Hu)	11772	11773	11775	11776	11777	*	11326
QUANTITY	1	1	5	1	1	1	1

* 200 VOLTS 12714
208 VOLTS 12715
220 VOLTS 12716
230 VOLTS 12717
240 VOLTS 12718
380 VOLTS 12719
400 VOLTS 12720
415 VOLTS 12721
440 VOLTS 12722
460 VOLTS 12723
575 VOLTS 12724

January, 1990

SUPPLEMENT

Torque Specifications for Cap Screws 16050, 16523, 17390, 62425

Some cap screws on this machine, if not properly tightened, may work loose and fracture during periods of heavy machine usage. These screws are generally used on gear and pulley hubs, knife spindle hubs or for mounting spindle assemblies. See the parts lists in this manual for exact locations.

Cap screws 16050, 16523, 17390 and 62425 should be torqued to 45-50 foot pounds (61 to 68 Newton-meters) using a torque wrench or 62297 "L" handle wrench and sufficient hand force. This torque value does **not** apply to Comitrol Processor impeller mounting screws.

NOTE: *The 62297 L-Handle Wrench replaces the 17389 T-Handle Wrench in the following manuals: Model J, J9-A and M.*

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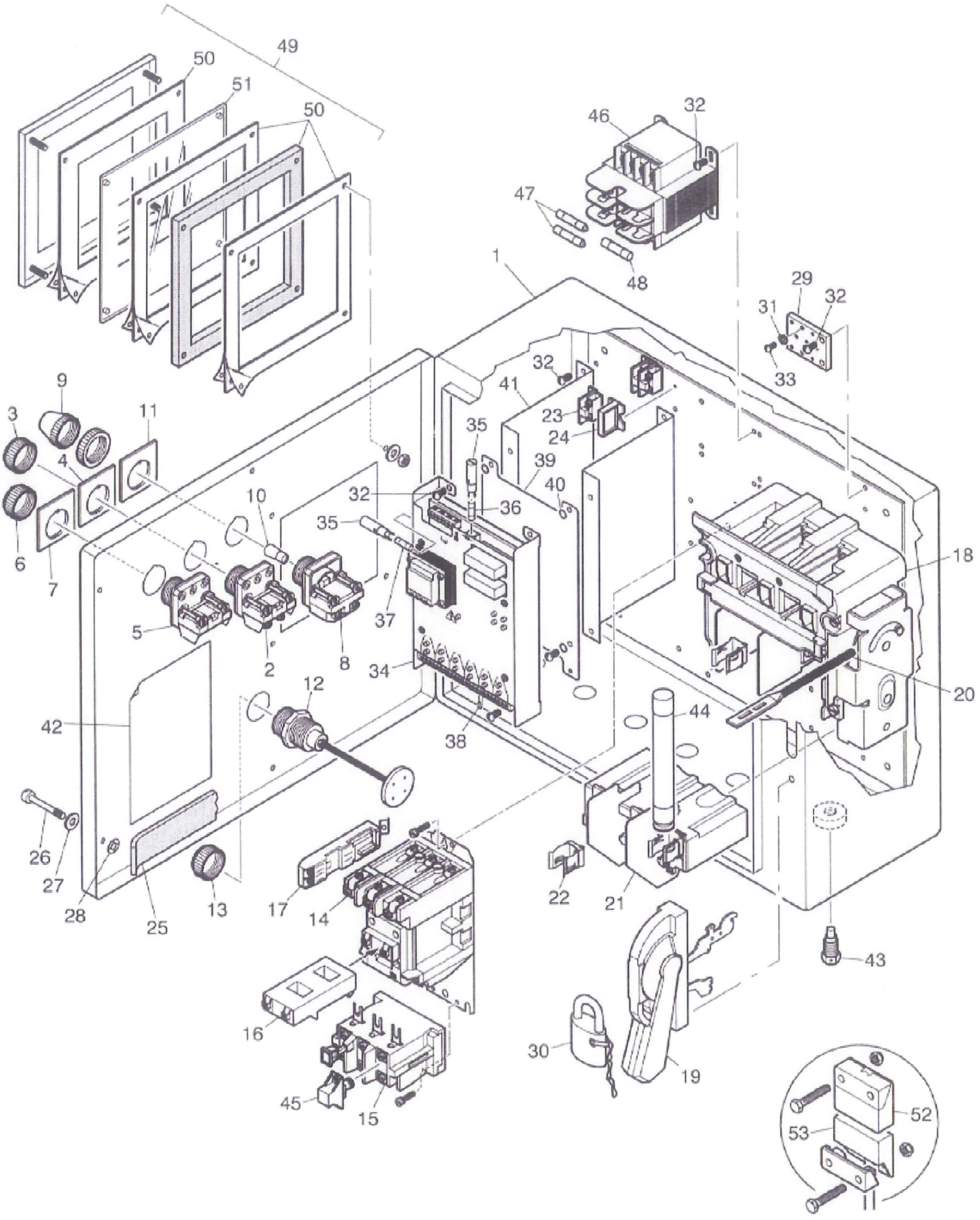
Designers and manufacturers of precision size reduction equipment.

February 1998

Electrical assemblies addendum to the instruction manuals for machines with 5 H.P. or less motors; includes assemblies with NEMA and IEC components.

PARTS

Electrical Assembly (NEMA components)



PARTS

Electrical Assembly (NEMA components)

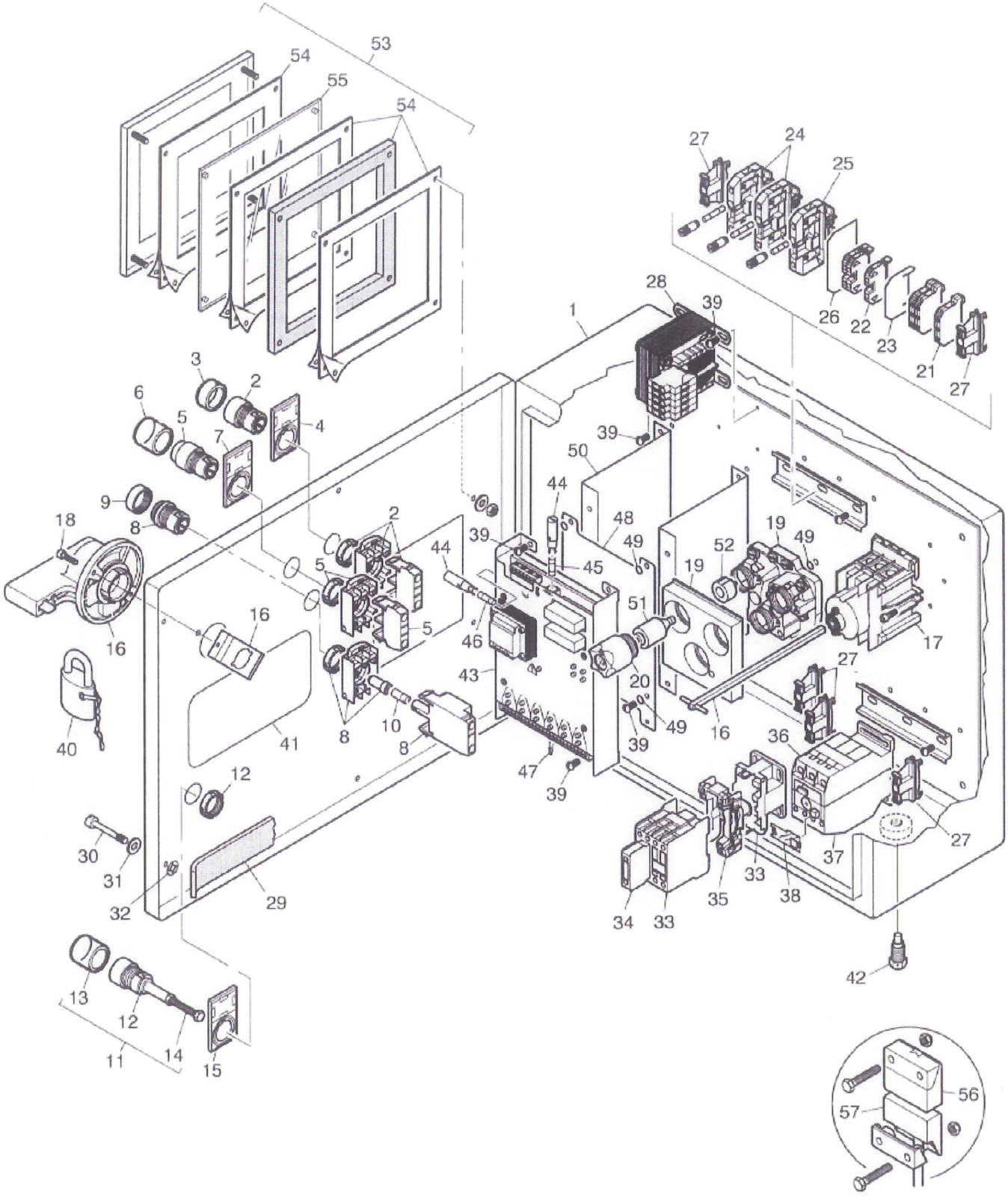
ITEM NO.	PART NO.	DESCRIPTION	QTY.
—	*	**Electrical Assembly,** *(includes items 1–53)*	1
1	*	**Combination Starter,** *size "1", (includes items 2–29)*	1
2	13449	**Push Button,** *start, (includes item 3)*	1
3	60218	**Rubber Boot,** *start*	1
4	12605	**Legend Plate,** *start, I*	1
5	13450	**Push Button,** *stop, (includes item 6)*	1
6	60219	**Rubber Boot,** *stop*	1
7	12606	**Legend Plate,** *stop, O*	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	13596	**Fastener for Enclosure**	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"*	4
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*	10
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	*	**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
52	63741	**Actuator**	*
53	63739	**Sensor,** *12' lead*	*

* Consult the factory

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

PARTS

Electrical Assembly (IEC components)



PARTS

Electrical Assembly (IEC components)

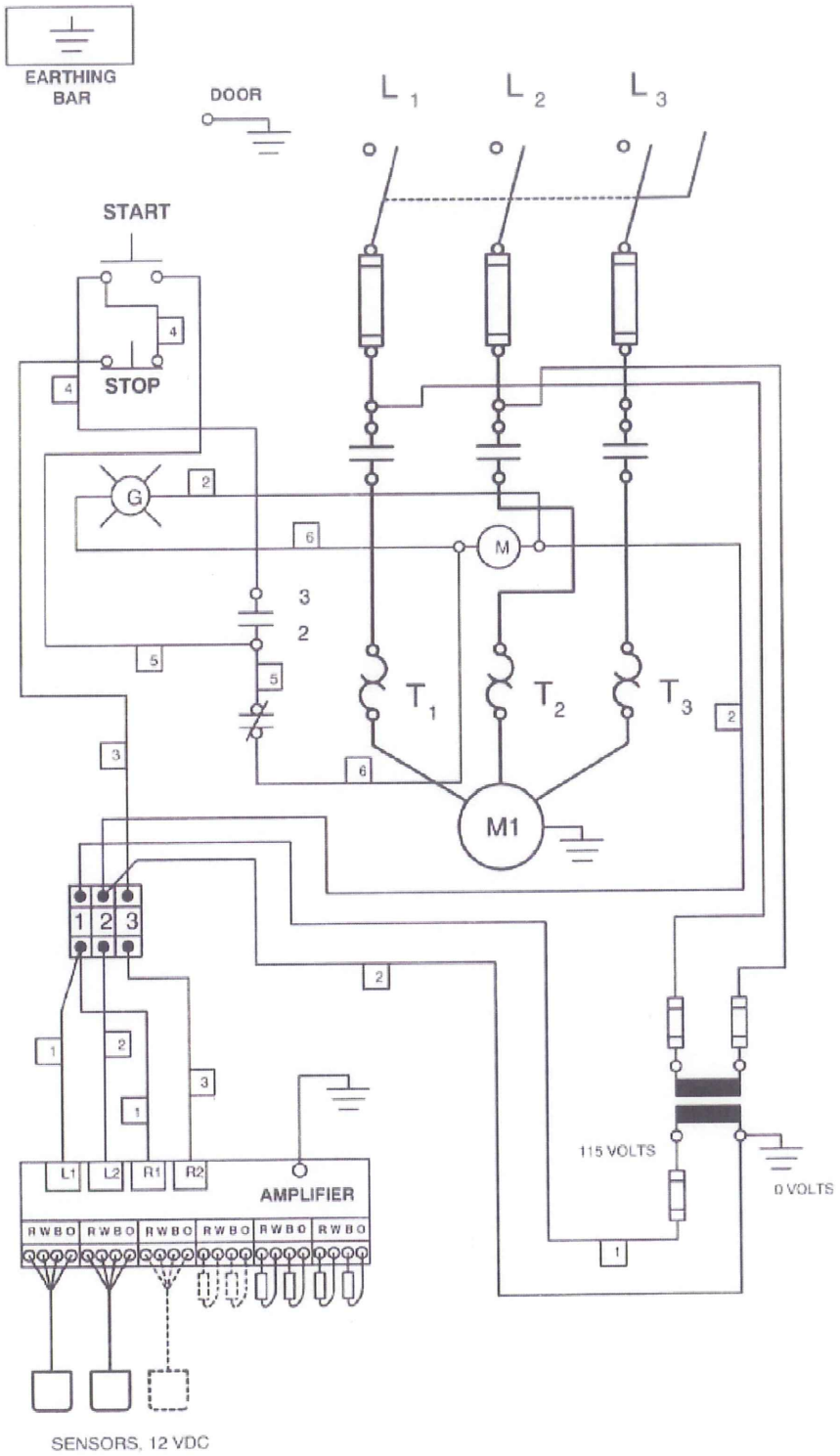
ITEM NO.	PART NO.	DESCRIPTION	QTY.
—	*	**IEC Electrical Assembly,** *(includes items 1–57)*	1
1	*	**Combination Starter,** *IEC, 22 amp with lugs, (includes items 2–36)*	1
2	12740	**Start Button Assembly,** *(includes item 3)*	1
3	12748	**Protective Cap,** *flush head, IEC*	1
4	12742	**Name Plate,** *(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	12774	**IEC Disconnect Switch Handle**	1
17	12775	**IEC Disconnect Switch**	1
18	12782	**Machine Screw,** *4 mm x 16 mm*	2
19	13491	**Fuse Base,** *25 amp., (E27 thread)*	1
20	13489	**Screw Cap,** *(E27 thread)*	3
21	12750	**Earthing Terminal,** *IEC*	3
22	12760	**Terminal,** *IEC, (includes item 23)*	3
23	*	**Barrier,** *IEC*	1
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	12751	**End Anchor,** *IEC*	5
28	*	**Control Circuit Transformer**	1
29	12882	**Door Gasket,** *(fitting and adhesive required)*	1
30	13596	**Fastener for Enclosure**	4
31	13602	**Nylon Washer**	4
32	13618	**Retainer**	4
33	12753	**Contactor,** *22 A., IEC, (includes items 34 & 35)*	1
34	12755	**Front-Mount Auxiliary Contact,** *N.O.*	1
35	12754	**Coil,** *110/120 volts, 50/60 Hertz, IEC*	1
36	13677	**Overload Base Adapter**	1
37	*	**Overload Relay**	1
38	13678	**Transparent Cover for Adjustment Dial**	1
39	10625	**Round Head Machine Screw,** *w/washer, 10-32 x 1/2"*	14
40	13408	**Padlock,** *with chain*	1
41	*	**Wiring Diagram**	1
42	11593	**Breather/Drain,** *1/4"*	1
43	63737	****Amplifier,** *(includes items 44–47)*	1
44	13673	**Adapter**	2
45	13671	**Fuse,** *.630 amp.*	1
46	13672	**Fuse,** *.125 amp.*	1
47	63755	**Resistor,** *22 kOhm*	10
48	63747	**Adapter Plate**	1
49	12633	**Rubber Washer**	4
50	13561	**Amplifier Bracket**	2
51	*	**Fuse**	3
52	*	**Fuse Adapter**	3
53	13599	**Window Replacement Kit,** *(includes items 54 & 55)*	1
54	13713	**Window Gasket Kit**	1
55	—	**Window,** *(not sold separately)*	1
56	63741	**Actuator**	*
57	63739	**Sensor,** *12' lead*	*

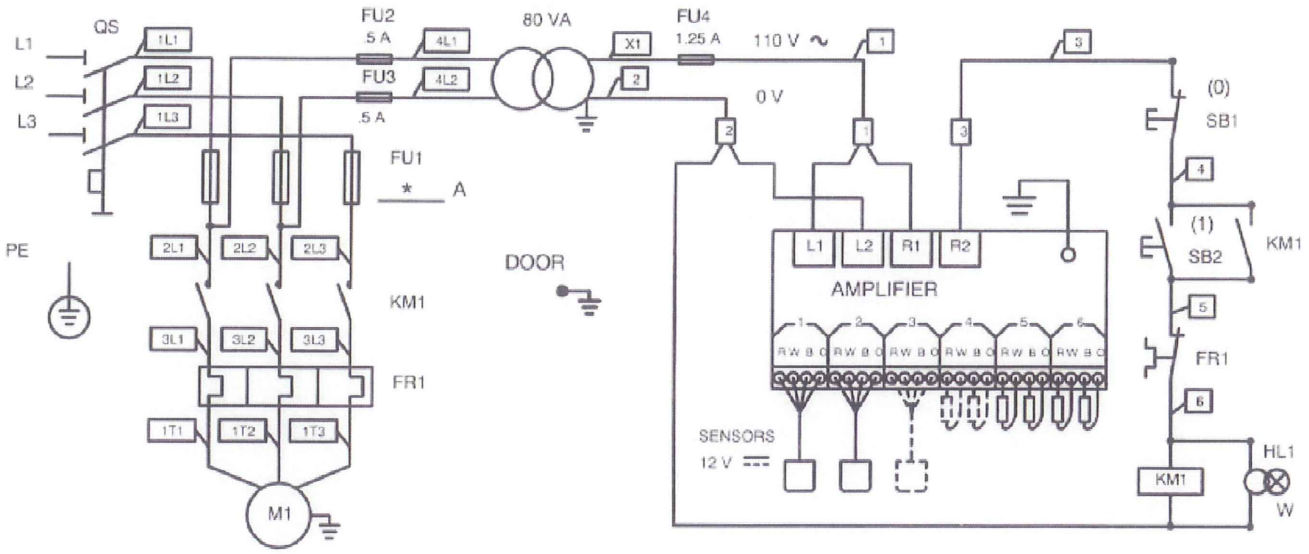
* Consult factory

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

PARTS

Electrical Schematic (NEMA)





* See schematic inside starter enclosure for fuse amperage.

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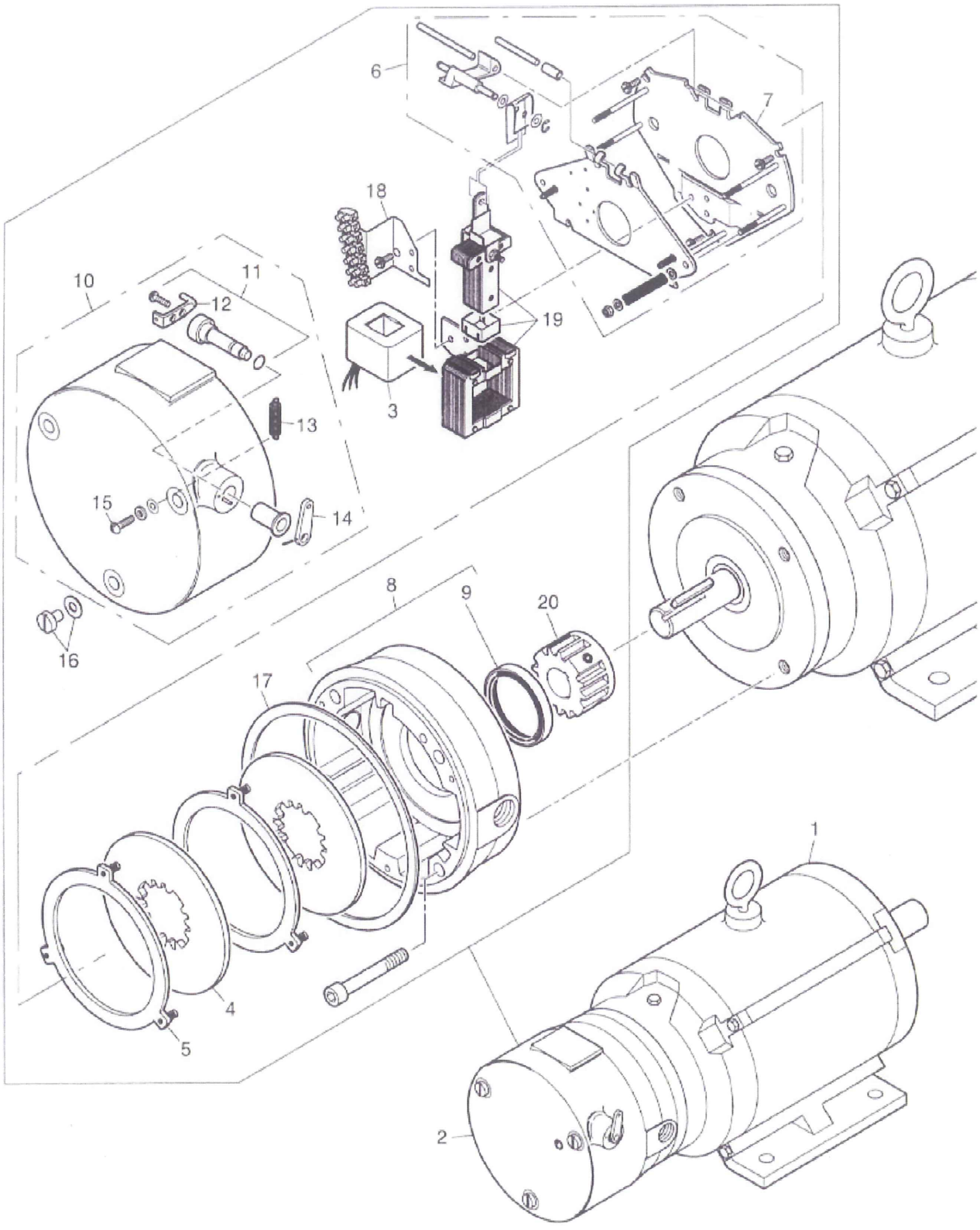
Designers and manufacturers of precision size reduction equipment.

February 1998

Motor with Stearns 56200 brake assembly, 10 LB-FT

PARTS

10 LB-FT Stearns 56200 Brake Assembly



PARTS

10 LB-FT Stearns 56200 Brake Assembly

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 VFD electrical assembly, (includes items 3–20)*	1
	12898	**Brake Assembly,** *10 pound foot with 220 volt coil, 56200, use with across the line electrical assemblies, (includes items 3–20)*	1
	12899	**Brake Assembly,** *10 pound foot with 575 volt coil, 56200, use with across the line electrical assemblies, (includes items 3–20)*	1
3	12884	**K4 Solenoid Coil,** *110-120 volts*	1
	12885	**K4 Solenoid Coil,** *200-240 volts*	1
	12886	**K4 Solenoid Coil,** *575 volts, (for use in Canada)*	1
4	12890	**Friction Disc**	2
5	12891	**Stationary Disc Kit**	1
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	12905	**Seal for Endplate**	1
10	12894	**Housing and Release Assembly,** *(includes items 11–15)*	1
11	12910	**Manual Release Assembly,** *(includes items 12–14)*	1
12	12907	**Release Lever**	1
13	12908	**Spring for Release Lever**	1
14	12913	**Handle,** *manual release, s.s.*	1
15	10191	**Round Head Machine Screw,** *10-24 x 3/4", s.s.*	1
16	12911	**Housing Nuts and Gaskets**	3
17	12906	**Gasket,** *housing and endplate*	1
18	12909	**Terminal Kit**	1
19	12904	**Plunger, Link and Frame Assembly**	1
20	12895	**Hub and Set Screw Assembly**	1

* Consult the factory.

November 29, 2000

IMPORTANT NOTICE!
CHANGE OF RECOMMENDED LUBRICANT

ROYAL PURPLE Ultra-Performance Clear FDA™ Synthetic Grease No. 0
for use on
Models G-A, GK-A, H-A, HX-A, OC, OC-45, OV, Q, TRS 2000 & TRS 2500

Due to recent advances in synthetic grease technology and after extensive testing, Urschel Engineering is now recommending Royal Purple Ultra-Performance Clear FDA™ synthetic grease, No. 0 (NLGI grade 0) on the machine models listed above. Royal Purple Ultra-Performance Clear FDA™ synthetic grease has proven to be an effective lubricant for both wet and extended run applications; see photos below. All new machines and replaceable components such as spindle bearing assemblies and crosscut knife assemblies for the stated models will be supplied with the Royal Purple grease. In addition, to extend the life of the machines and components already in operation, Urschel Laboratories strongly recommends that you upgrade your existing Model G-A, GK-A, H-A, HX-A, OC, OC-45, OV, Q, TRS 2000 and TRS 2500 machines to Royal Purple Ultra-Performance Clear FDA™ grease as well.

Royal Purple Ultra-Performance Clear FDA™ synthetic grease can be introduced into existing machinery by greasing the lubrication points until the old lubricant is purged from the machine. Refer to machine manual for lubrication points and schedules for your particular machine.

Royal Purple Ultra-Performance Clear FDA™ synthetic grease, No. 0 (NLGI grade 0) can be purchased from Urschel Laboratories in 14.5 ounce cartridges, part #11915.

Royal Purple Ultra-Performance Clear FDA™ synthetic grease, No. 0 meets the USDA H-1 classification for incidental contact in federally inspected meat and poultry plants. See separate spec sheet.

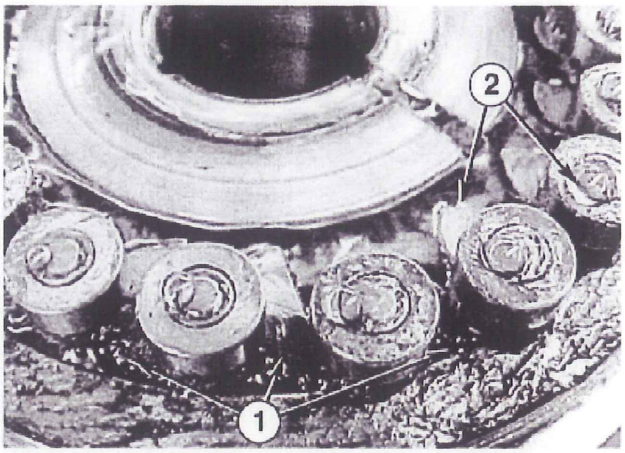


Figure 1 — Wet Test, G-A Crosscut Spindle. Royal Purple Ultra-Performance Clear FDA grease run time of 8 hours. Internal parts remain well lubricated. (1) Grease pockets, (2) Water.

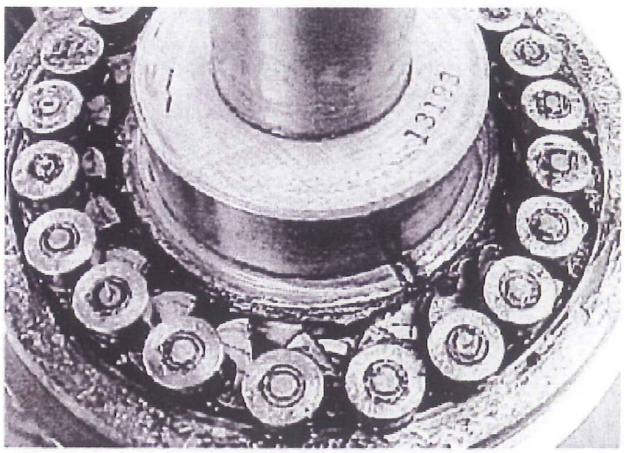


Figure 2 — Dry Test, G-A Crosscut Spindle. Royal Purple Ultra-Performance Clear FDA grease run time of 300 hours. Internal parts remain well lubricated.

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Ultra-Performance Clear FDA™

Synthetic Grease

Urschel Laboratories Part No. 11915

Ultra-Performance Clear FDA Synthetic Grease is a clean, clear, colorless, nonstaining, nondrying, biodegradable aluminum complex H-1 grease authorized by USDA for use in Federally Inspected meat and poultry plants. It meets or exceeds the requirements of CFR, Title 21, Paragraph 178.3750 of FDA Regulations and is specifically designed for use in the food processing industry where it may have incidental contact with food. Ultra-Performance Clear FDA Synthetic Grease is extremely water resistant even after frequent wash downs. Polymer additives plus Teflon* provide superior adhesive/ cohesive strength to lower friction and protect against high shock loads.

Ultra-Performance Clear FDA Synthetic Grease contains a bacteriostatic agent to retard bacterial and fungus growth. Antiwear additives protect against metal to metal contact providing longer machine life and increased productivity. Ultra-Performance Clear FDA Synthetic Grease can be used in applications from 0° - 400°F (-18° - 204°C). It is recommended for lubrication of roller, needle, ball, journal, and sliding bearings in the food processing and handling industries.

Ultra-Performance Clear FDA's benefits are:

- Aluminum Complex Grease Base: an adhesive, non-drip base possessing superior shear stability, water resistance and high temperature performance.
- Multi-Temperature: synthetic molecules allow good low temperature pumpability and high temperature stability. Suitable for centralized pressure systems.
- Bacteriostatic Agent: retards bacterial and fungus growth.
- Increases Food Machinery Life: contains synthetic ingredients, anti-wear additives plus Teflon*.
- Biodegradable
- Prevents Rust & Corrosion
- Nonstaining / Nontoxic

*E.I. Dupont Company Registered Trademark

Ultra-Performance Clear FDA™

Synthetic Grease

Urschel Laboratories Part No. 11915

ASTM	Test	Typical Properties*
- - - -	NLGI Grade	0
- - - -	Texture	Buttery
- - - -	Thickener type (soap base)	Aluminum Complex
- - - -	Color	Clear to Translucent Light Amber
- - - -	Base Oil	Semi-Synthetic
- - - -	USDA H-1	Yes
D-217	Cone Penetration, mm	365
	Worked	500 (260)
D-2265	Dropping Point, °F (°C)	
D-2161	Base Oil Viscosity,	126
	cSt @ 40°C	1A
D-4048	Copper Strip Corrosion	
D-2266	Four-Ball Wear Test,	
	scar width, mm, 40 kg.	0.70
	1200 rpm, 165°F, 1 hr.	Pass
D-1743	Rust Resistance	
- - - -	Low Temperature Pumpability	15 (-9)
	°F (°C)	

*Properties are typical and may vary.

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www.royalpurple.com

FOREWORD

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.

THIS MANUAL MUST BE READ BY OR TO EACH PERSON BEFORE THAT PERSON OPERATES, CLEANS, REPAIRS, ADJUSTS, SUPERVISES THE OPERATION OF, OR USES THIS MACHINE IN ANY WAY.

ESTE MANUAL DEBE SER LEIDO POR A CADA PERSONA ANTES DE COMENZAR A OPERAR, LIMPIAR, REPARAR, AJUSTAR, SUPERVISAR LA OPERACION DE, O UTILIZAR ESTA MAQUINA DE CUALQUIER MANERA.

CE MANUEL DOIT ETRE LU PAR, OU A, TOUTE PERSONNE AVANT QU'ELLE NE METTE EN ROUTE, NETTOIE, REPARE, REGLE, SUPERVISELE FONCTIONNEMENT OU UTILISE CETTE MACHINE, DE QUELQUE MANIERE QUE CE SOIT.

SAFETY

READ AND PRACTICE SAFETY RULES IN THIS MANUAL:

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

2. When guards are 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** 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, repair or maintain the machine. Cleaning and maintenance procedures are found in this instruction manual.

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

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 this instruction manual and should be read and understood by all maintenance, service, or operation personnel.

9. The sound pressure level produced by Comitrol® Processors is likely to exceed 85 dB(A). Use adequate hearing protection.

SAFETY

Safety Signs

Safety signs and safety switches are placed on Urschel® machines to help you avoid personal injury. ***They are there for your protection.*** *If your machine does not have these signs or switches, you must not operate the machine. Notify your supervisor and contact Urschel Laboratories, Inc.*

Figure 1 — Caution label

Caution label 11666 (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 label 11662 (Figure 2) is placed at or near the feed opening to warn you and anyone near the machine to keep hands and all other foreign objects away from the feed opening.

Figure 3 — Danger label, discharge chute

Danger label 11663 (Figure 3) is 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 label** 11665 (Figure 4) is visible when a protective cover or guard has been 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

⚠ **Danger label** 11667 and **Hazard Alert label** with a number that indicates the voltage requirements of the machine (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.

SAFETY

Protective Devices

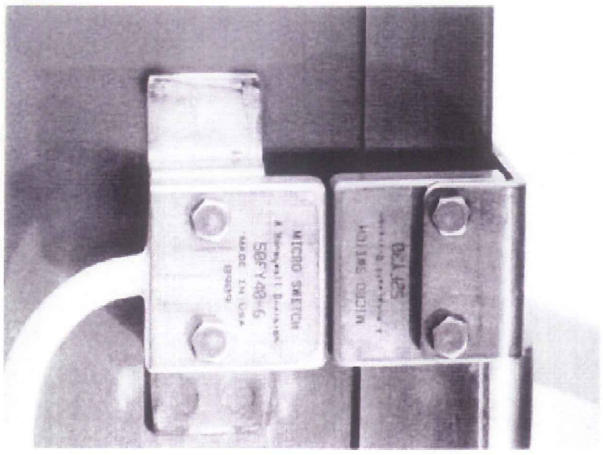


Figure 6 — Safety switch

⚠ **Safety switches** (Figure 6) are provided to prevent operation of the machine when a protective cover or guard has been 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 "STOP" button then **disconnect and lock out the power source** before removing any part from the machine.

Figure 7 — Power disconnect/lockout switch

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

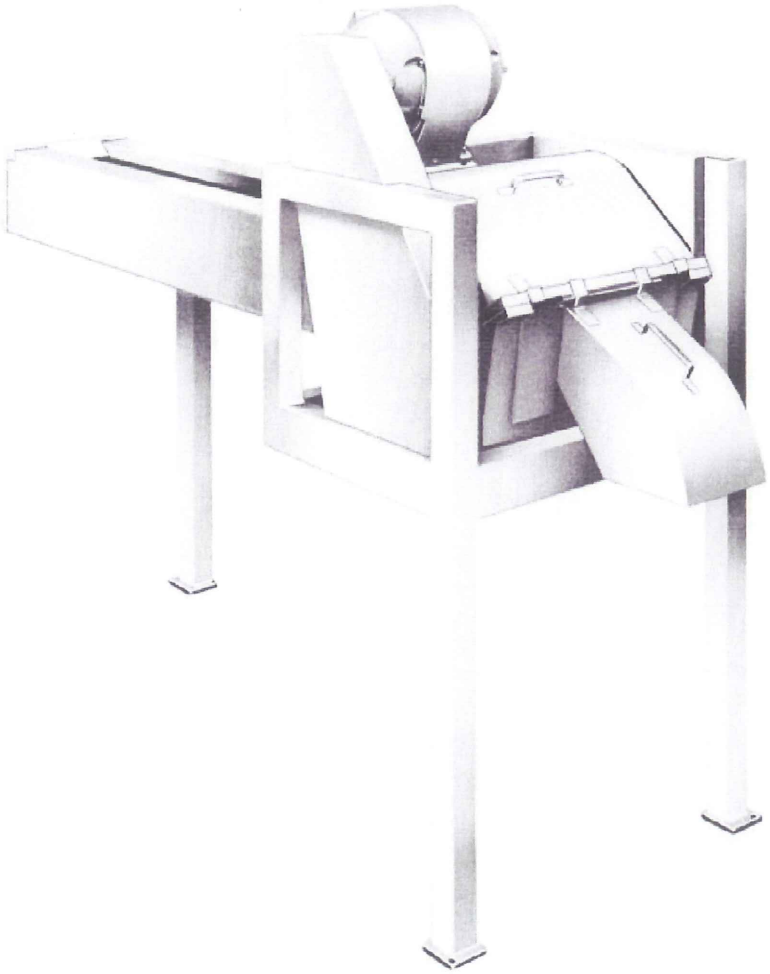
⚠ **Covers and guards** protect potentially dangerous machine areas. These covers and guards are of utmost importance to safe machine operation. ***Never attempt to operate the machine with a cover or guard removed or serious injury may occur!***

Covers and guards, safety signs and safety switches are standard equipment on all 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.

URSCHEL

MODEL HX

DICER and STRIP CUTTER



MANUFACTURED BY

URSCHEL LABORATORIES INCORPORATED

VALPARAISO, INDIANA 46383

PRECISION HIGH-SPEED FOOD CUTTING EQUIPMENT

manufacturers of precision, high-speed cutting equipment for food products

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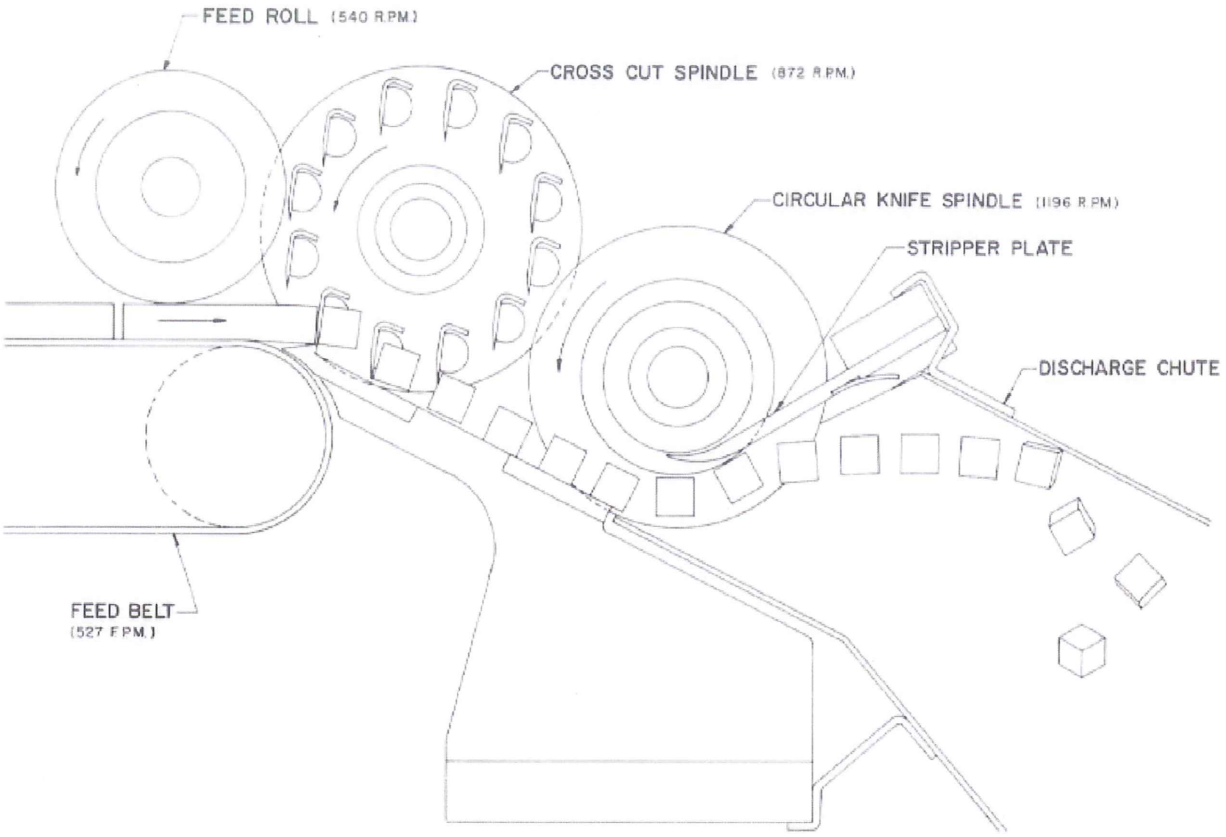


GENERAL INFORMATION

OPERATING PRINCIPLE

The illustration above shows the operating principle of the Urschel Model HX Dicer and Strip Cutter. Product of controlled maximum thickness is cut into squares or rectangular shapes by the action of cross cut and circular knife edges positioned at right angles to each other. A moving feed belt carries product to the dicing mechanism where strips are produced by the cross-cut knife spindle. These strips move a short distance and enter parallel edges of the circular knife spindle to complete the second dimension cut. Rotation of the circular knife spindle and action of the stripper plate gently removes cut product from between the knives, guiding it into the discharge chute.

The Model HX is especially suitable to soft or fragile products which cannot generally be diced without excessive waste and damage. Rapid changes in the direction of product movement are avoided, making gentle, high speed cutting possible without crushing and impact.

SIZE OF CUTS

Interchangeable parts are available for square cuts measuring 5/8", 3/4" and 7/8". Thickness of the squares will be the thickness of product fed to the machine.

The spacing between circular knives must always be equal to, or greater than product thickness. For instance, product thickness cannot be greater than 1/4" when a circular knife spindle for 1/4" cuts is used.

Maximum product thickness or depth on the feed belt is 3/4" or 1-1/8" depending upon cross cut knives used. This is explained on page 8 under *"Knives."*

Many sizes of cut are possible by combining the various selections of circular knife spacing with different cross cut knife spindles.

Product structure, firmness and thickness will cause a variation in the size of cut, and sizes on the chart are average based upon product thickness of 3/4". The 5/8" cut is based, however, on maximum product thickness or depth of 5/8".

Larger cuts than shown on the chart can be produced by removing alternate cross cut knives. For example, spindle 28544 will produce cuts measuring approximately 1-1/4" when every other knife is removed.

Further variation of cut sizes is possible with the circular knife spindle by using suitable knife spacers and stripper plates.

MODEL HX CROSS CUT	
Size of Cut	Part Numbers of Cross Cut Spindle and Knives
5/8"	28544 ass'y. - 12 15271 knives
3/4" (13/16)	28545 ass'y. - 9 15271 knives 28591 ass'y. - 9 28558 knives
7/8" (29/32)	28546 ass'y. - 8 15271 knives 28592 ass'y. - 8 28558 knives
1-1/4"	28544 ass'y. - 6 15271 knives 28593 ass'y. - 6 28558 knives
1-1/2"	28587 ass'y. - 5 15271 knives 28584 ass'y. - 5 28558 knives
1-7/8"	28544 ass'y. - 4 15271 knives 28593 ass'y. - 4 28558 knives
2-1/2"	28544 ass'y. - 3 15271 knives 28593 ass'y. - 3 28558 knives

CAPACITY

Capacity of the HX is determined by the thickness and character of the product being cut, and also by the manner of feeding. A uniform, constant feed of dense, moist product at maximum thickness of 3/4" will yield up to 14,000 pounds hourly. Thinly sliced or bulky products may yield capacities as low as 500 pounds hourly.

CONSTRUCTION

Product contact materials used in the Model HX Dicer are stainless steel and approved manganese aluminum bronze alloy. A neoprene feed belt carries product into the cutting mechanism.

The machine frame is made of tubular stainless steel and the guards, discharge chute and shields are fabricated from stainless steel sheet.

SPECIFICATIONS

Net weight with motor . . . . . 559 pounds
Weight crated for shipment with motor . . . 768 pounds
Gross weight without motor for export . . . 919 pounds

MOTOR REQUIRED

Two horsepower, totally enclosed, non-ventilated, 1800 revolutions per minute, NEMA frame number 184.

INSTALLATION and OPERATION

MOTOR ROTATION

The motor must be wired so that rotation is clockwise when viewed from the pulley side of the machine.

MACHINE SPEED

Maximum speed of the driven shaft 28508 must never exceed 675 revolutions per minute. This is considered standard operating speed, however, other pulley combinations may be used when slower cutting speeds are desirable.

The Model HX should never be run at a higher speed than stated above. The increased feed belt speed does not allow sufficient time for product acceleration and poor cutting quality results. Higher speed also seriously shortens the life of cross cut knife spindle bearings and working parts.

PRODUCT DELIVERY TO MACHINE

Quality of cutting depends largely upon a steady flow of uniform product onto the feed belt. Material which is too thick, or which is distributed unevenly on the belt, will be damaged severely during cutting.

An adjustable feed roll just ahead of the cross cut knife spindle insures positive feed of product into the cutting mechanism.

The feed assembly must be adjusted to suit the average product thickness. Excessive clearance will result in erratic feeding and may allow small pieces of product to tip upward as the cross cut knives enter resulting in wedge or slivered cuts.

The Model HX must never be started or stopped when the feed belt and cutting mechanism is full of product. The life of the knives and bearings is decreased due to the strain of starting under a load, and the product being cut while the machine is reaching speed is of poor quality.

LUBRICATION

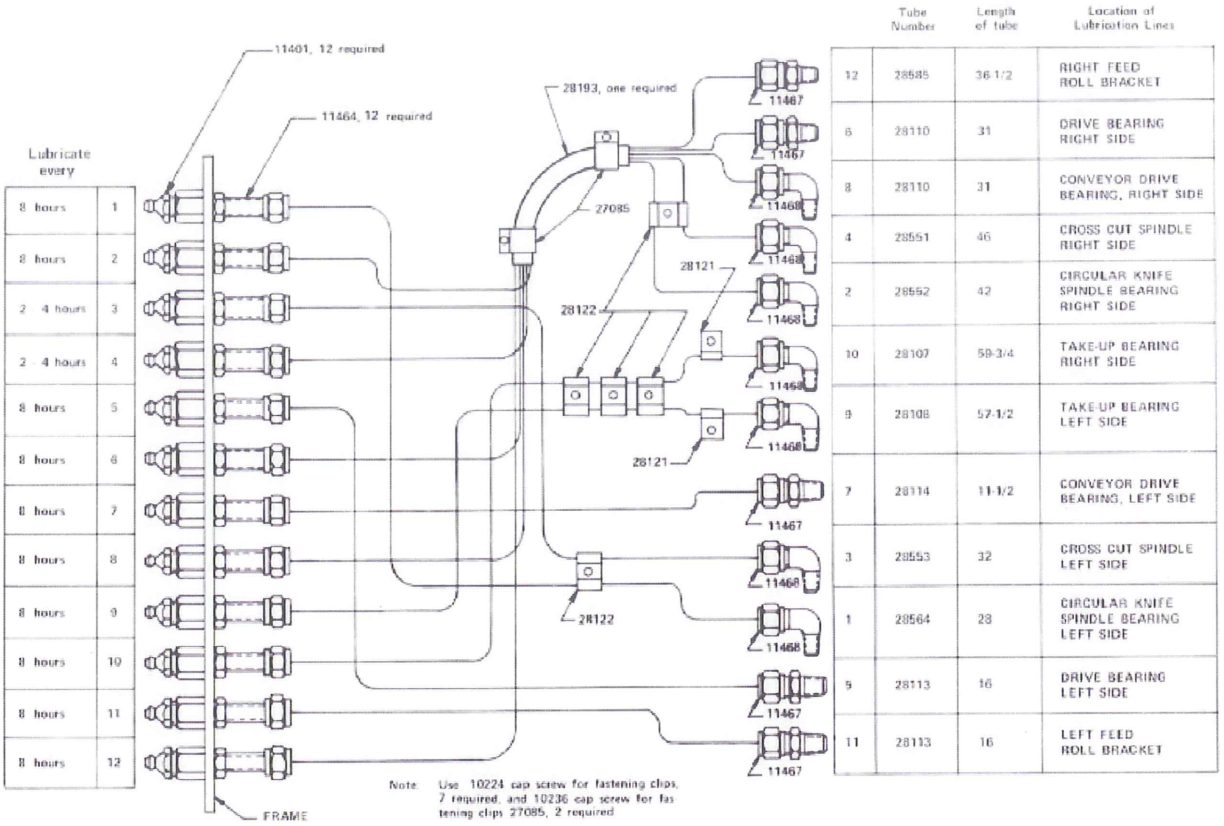
Systematic lubrication is most important in order to insure trouble free operation of the Urschel Model HX Dicer for a long period of time.

Frequent lubrication insures an adequate reserve of lubricant for each moving part. Dirt and moisture are less likely to enter bearings that are properly lubricated.

Lubrication should be performed as soon as possible after the machine has been washed so that water and cleaning solutions are driven out of bearings and moving parts.

Non-toxic lubricants meeting USDA approval requirements, such as Haynes Lubri-Film or equivalents, should be used for all bearings.

There are twelve pressure-type lubricant fittings located on a convenient panel at the forward end of the feed belt. The two fittings for the cross cut knife spindle should be lubricated every two to four hours of operation. All other fittings should receive lubricant at



Lubricate every	
8 hours	1
8 hours	2
2 - 4 hours	3
2 - 4 hours	4
8 hours	5
8 hours	6
8 hours	7
8 hours	8
8 hours	9
8 hours	10
8 hours	11
8 hours	12

	Tube Number	Length of tube	Location of Lubrication Lines
12	28585	36-1/2	RIGHT FEED ROLL BRACKET
6	28110	31	DRIVE BEARING RIGHT SIDE
8	28110	31	CONVEYOR DRIVE BEARING, RIGHT SIDE
4	28551	46	CROSS CUT SPINDLE RIGHT SIDE
2	28552	42	CIRCULAR KNIFE SPINDLE BEARING RIGHT SIDE
10	28107	59-3/4	TAKE-UP BEARING RIGHT SIDE
9	28108	57-1/2	TAKE-UP BEARING LEFT SIDE
7	28114	11-1/2	CONVEYOR DRIVE BEARING, LEFT SIDE
3	28553	32	CROSS CUT SPINDLE LEFT SIDE
1	28564	28	CIRCULAR KNIFE SPINDLE BEARING LEFT SIDE
5	28113	16	DRIVE BEARING LEFT SIDE
11	28113	16	LEFT FEED ROLL BRACKET

least once every eight hours of operation. Refer to the diagram above indicating the numbered fittings which supply the different moving parts of the machine.

Over lubrication wastes grease and increases the possibility of product contamination.

All exposed bronze and fiber gears should be lubricated using the specially compounded lubricant which is available in pressurized containers from Urschel Laboratories. This product is superior to ordinary grease or oil because it adheres to gear tooth surfaces at operating speeds and is not affected by water. Gears should be lubricated whenever inspection shows the coating of lubricant to be worn away from tooth faces.

The motor should be lubricated in accordance with the instructions furnished by the motor manufacturer.

HEATING OF CROSS CUT SPINDLE

The operating temperature of the cross cut spindle may normally run as high as 180 to 200 degrees. This will be especially true in the case of new spindles, or spindles that have been recently reconditioned. Such temperature is not considered excessive, and is in no way injurious, so long as the recommended lubrication procedure is followed. Since the spindle assembly consists of many closely fitted parts operating at high speed, much of the heat is generated by the churning and agitation of lubricant contained in the housing. For this reason, smaller amounts of lubricant at frequent intervals are more desirable, than a large quantity, occasionally applied.

MAINTENANCE

NOTE TO MAINTENANCE PERSONNEL

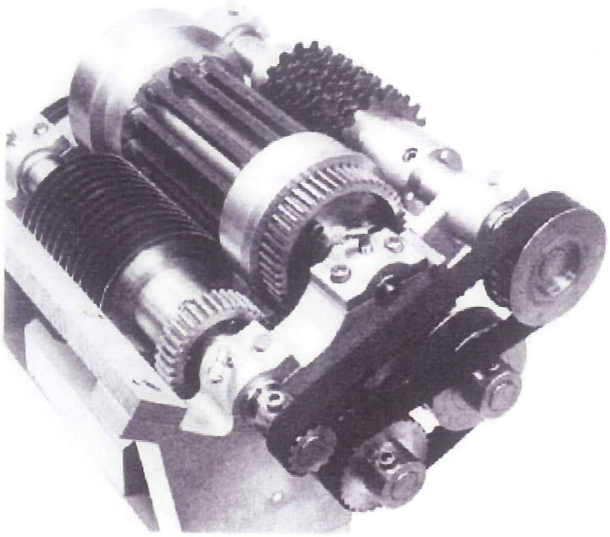
Never attempt machine adjustment or inspection until the machine has stopped and the electrical source has been disconnected. This is the only way you can protect yourself from the danger of accidental starting of the machine while you are working upon it.

FEED ROLL ADJUSTMENT

The product feed roll is adjustable to any of seven heights above the feed belt. Settings are in 1/8" steps from a minimum of 3/8" to a maximum of 1-1/8". The feed roll is driven from the circular knife spindle shaft by means of a timing belt. This is illustrated on page 7.

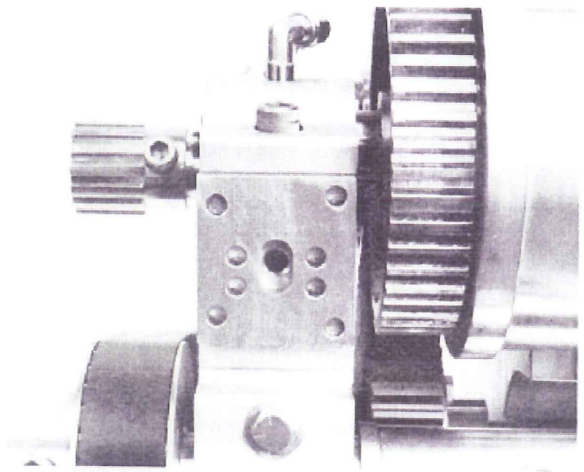
Height of the feed roll should be slightly less than the average product thickness to insure positive transfer to the cross cut knife spindle.

Height setting of the feed roll is changed in the following manner.



The feed roll is driven from the circular knife spindle shaft by a timing belt.

1. Remove the timing belt 28583 by first removing the small 14 tooth pulley from the circular knife spindle shaft.
2. Remove the cap screw 16050 from the feed roll. Support the feed roll with one hand and slide the shaft and pulley from the machine so the feed roll can be removed.
3. Height setting is obtained by selecting the desired position of the bearing holders 28580 and 28581 on the numbered locating blocks 28573. The locating blocks can be installed in any of four positions and each position provides two locations for the bearing holder. The two numbers which appear at the left side of the block in each selected position indicate the choice of height settings in 1/8's of an inch. For example, figure A shows the block position for 1/2" or 7/8" (4/8's or 7/8's) height setting. Figure B shows the position for 3/4" or 1-1/8" (6/8's or 9/8's) height setting.
4. Install both bearing holders in identical positions and tighten the cap screws 28574 which hold them. The feed roll and shaft are then installed by reversing steps 1 and 2.
5. Do not stretch or sharply bend the timing belt during installation. This belt should be installed by first putting it over the larger flanged pulley and the circular knife spindle shaft. Then slide the small 14 tooth pulley through the belt and onto the shaft, using the smooth pulley hub as a guide. This method permits easy alignment of teeth as the pulley is pushed into position, and prevents damage to the timing belt.



The locating blocks illustrated above can be installed in any of four positions and by re-positioning the bearing holders, the height setting of the feed roll may be adjusted.

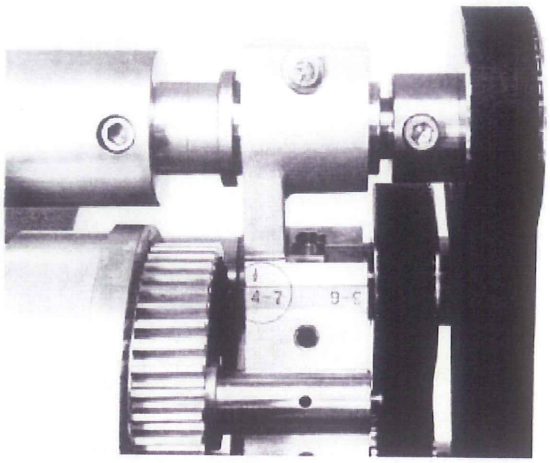


Figure A

FEED BELT ADJUSTMENT

Install a new feed belt on the machine in such a manner that the belt lap on the inside surface of the belt runs ahead of the lap on the outside surface of the belt. This is important to avoid tearing open the lap. The feed belt should be kept sufficiently taut so it does not sag under the center section of the rolls more than 1/2". It is

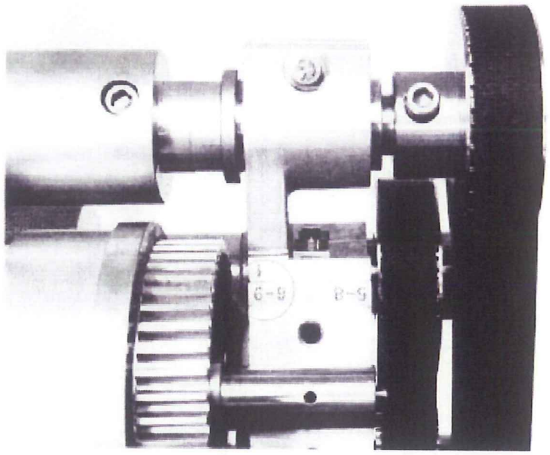
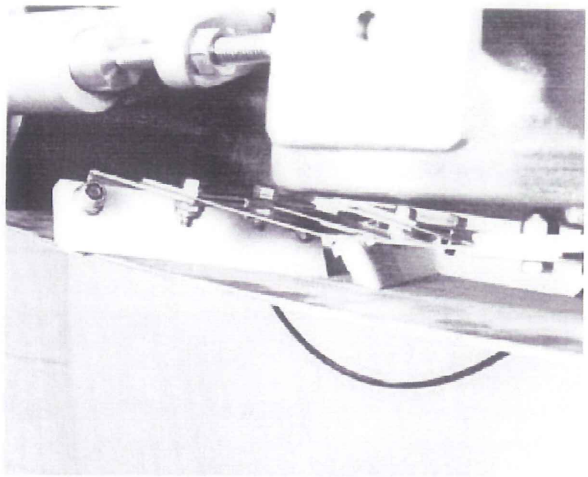


Figure B



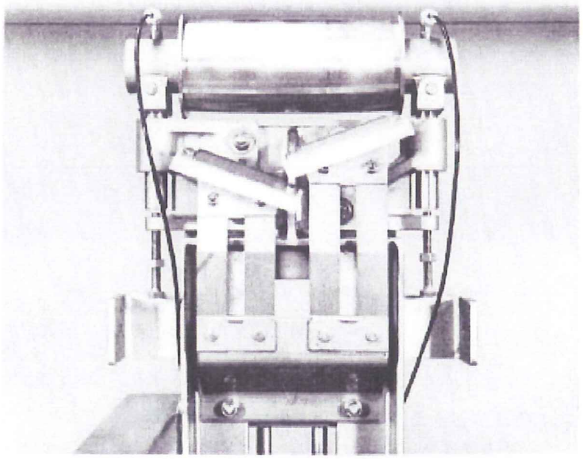
The feed belt cleaner prevents small pieces of product from adhering to the inside surface of the feed belt.

most important that the belt be centered with the rolls. When the belt runs off to one side of the machine, material may get inside causing the dicing assembly to tear the belt to pieces. If the belt runs to the right, the right hand side take-up should be tightened and the opposite side loosened. If the belt runs to the left, the opposite procedure should be followed.

Inspect the feed belt daily for damage and frayed edges which indicate incorrect centering. Worn spots on the belt surface indicate product may be adhering to the underside of the belt or on the drive roll, causing areas of the belt to rub against the shear plate edge.

FEED BELT CLEANER

A cleaning device is located at the rear of the Model HX Dicer to prevent small pieces of product from adhering to the inside surface of the feed belt. This cleaner consists of two scrapers which bear lightly against the belt as shown in photo above. The feed belt is removed in the photo below to show position of cleaner and method of mounting.



The feed belt has been removed to show the feed belt cleaner in position on the machine.

CLEANING

Major cleaning of the Model HX can be accomplished by directing a stream of water or cleaning solution along the feed belt into the dicing mechanism while the machine is running. **MAKE CERTAIN ALL GUARDS AND PROTECTIVE COVERS REMAIN IN PLACE UNTIL THE MOTOR HAS STOPPED AND THE POWER SOURCE HAS BEEN DISCONNECTED.**

Final cleaning may require removal of knife spindles and other parts, depending upon the type of product being cut.

KNIVES

Standard Model H cross cut knives, 15136, and circular knives, 15162, are suitable for general purpose fruit and vegetable cutting applications.

Unfrozen cooked meats and tempered frozen meats require heavy duty knives. Heavy duty knife 15271 is used on all cross cut knife spindles when slice thickness does not exceed 13/16".

Heavy duty knife 28558 must be used for slice thickness greater than 13/16" but not more than 1-1/8". Because of the greater width, knife 28558 can only be used on spindles requiring eight or nine knives, or on 12 pin spindles fitted with two, three, four or six knives uniformly spaced.

Heavy duty circular knives 28561 are less subject to damage resulting from deflection or foreign material, and have a thicker edge than the standard knife 15162.

REMOVING CROSS CUT KNIVES

Individual knives may be removed from the cross cut knife spindle without removing the spindle assembly from the machine. This is somewhat inconvenient, however, and if replacement of more than one or two knives is necessary, it is advisable to remove the entire spindle from the dicer.

Remove the cross cut knife spindle by first removing caps 28131 which are held in place by four socket head cap screws. Do not disconnect the lubricant tubes from the fittings in caps 28131. When replacing the spindle, make certain that all the surfaces are clean so that the shaft will not be distorted as the caps are tightened. Use hexagon screwdriver, 11003, to remove the screws in the ends of the cross cut knives. The screws which hold the knives in place have a nylon insert in the side of them to prevent the screws from coming loose. After the screws have been removed many times, the nylon will wear out and it will be necessary to discard the screws.

FEED FINGERS

Pointed feed fingers 15263 are used between circular knives to improve cutting action and discharge of frozen or very moist products.

Feed fingers are usually placed midway between circular knives using the stripper plate and spacers

required for cuts one half the desired size. For example, a circular knife spindle for 1" cuts, using feed fingers, would be assembled using 12 spacers for 1/2" cuts, 7 circular knives, and 6 feed fingers 15263. A stripper plate with 1/2" slot spacings is also required. Circular knife spacings greater than 1" may require two or more fingers between adjacent knives.

REMOVING CIRCULAR KNIVES

Before removing the circular knife spindle, it is necessary to remove the stripper plate. The knife spindle is removed by first removing the large socket head cap screw at the gear end of the spindle, and withdrawing the shaft, 28572, from the spindle and bearings.

To remove the circular knives from the spindle, the gear end of the spindle is grasped in a vise using soft jaws. Loosen the nut, 16390, on the other end using a special wrench, 16389. This is a right hand thread. When replacing the circular knives, it is important to position them properly. All the sides with serrations should face in one direction.

IMPORTANCE OF KEEPING KNIVES SHARP

Knives must be kept sharp or the product will be torn rather than cut, resulting in poor appearing strips or cubes. An increasing amount of fines and chips will be noticed whenever knives are dull, improperly sharpened, or the mechanical condition of the machine has deteriorated to any extent. If the circular knives are not kept sharp, the strips of material leaving the cross cut knives and entering the circular knives will not enter at a uniform rate and this will produce odd-shaped cubes and additional chips. The observance of abnormal quantities of chips in the cover above the circular and cross cut knives, and beneath the machine, should alert maintenance personnel to examine the dicer for dull knives or other damage.

SHARPENING CROSS CUT KNIVES

Before sharpening, inspect knives carefully for size. Cross cut blades which are 1/16" narrower than a similar new blade should be discarded, or sharpened and put aside for emergency use only.

Before sharpening, inspect knives for straightness and edge condition. Remove minor nicks and small edge defects by careful use of a fine stone or smooth file. Some large defects can be removed by use of a small hammer and a hardened flat surface upon which to work. Such straightening is not recommended however, since severe stretching of the hardened edge always accompanies any large nick. Straightening often causes unseen breakage of the edge and eventual loss of a metal fragment during machine operation.

Cross cut knives should be sharpened on the bevel side only using a hand stone or small grinder, removing as little metal as possible while retaining the original shape. A final keen edge can then be produced quickly by the buffing method described in the next column.

BUFFING SHARP EDGES

Knives with straight or crinkle edges can be sharpened in minimum time and with excellent results using the buffing method.

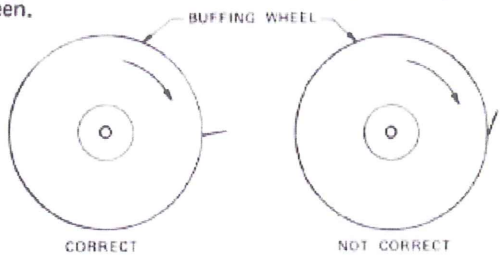
Dull or nicked knives must first be ground with an abrasive wheel or filed until a slight wire edge is produced. Buffing will later remove this wire edge. Before buffing, examine knives for damage and use a small stone to smooth minor nicks.

A one-third horsepower, 3600 revolutions per minute grinder with a 1/2" diameter shaft is found in most maintenance shops, or can be readily obtained.

The buffing wheel is 10" in diameter, 1/4" wide, 24 ply construction sewed in 1/4" squares, and provides a surface speed of 9,000 to 10,000 feet per minute when operating at 3600 revolutions per minute.

Buffing compound in bar form, composed of blended fine and coarse sharp grain is best suited to the stainless steels used in Urschel knives.

The buffing wheel must be installed between flanges at least 2" in diameter and tightened securely on the shaft. Turn on the grinder and hold the bar of buffing compound firmly against the narrow outer surface of the buffing wheel until a generous coating of compound can be seen.



Hold the knife very firmly with the bevel side upward and approximately parallel with the shaft of the grinder. Push the edge into the buffing wheel as shown in the illustration. Move the knife endwise until buffing of the entire edge is completed. It is important to remember that buffing is a form of grinding, using a soft abrasive wheel instead of a rigid one. It is possible to heat and burn the knife edge if one area is held against the buffing wheel too long.

For best results, move the edge across the buffing wheel with a steady rapid movement in each direction. Several rapid passes are better than one or two slow ones, and there is less danger of edge damage.

It may be necessary to turn the knife over and buff lightly with the bevel side down if a burr or wire edge remains.

Buffing sharp edges requires little time and only a fraction of the care which grinding or stoning demands. Failure to obtain sharp edges by buffing is generally caused by one or more of the following oversights.

Edges may be too dull or blunt. Buffing will not produce a sharp cutting edge under such conditions. Blunt edges must always be ground or filed to restore a bevel width and angle similar to that found on a new knife.

Edges can usually be buffed a number of times before it is necessary to re-grind or file.

Knives must be correctly held against the buffing wheel as illustrated in the sketch. Tipping the edge downward results in an excellent polishing job on the knife but does absolutely nothing for sharpness. A trial of different edge positions will quickly demonstrate which method is correct.

Apply compound to the wheel frequently to obtain sharp edges quickly. Discard buffing wheels when they are worn to 8-3/4" diameter.

SHARPENING CIRCULAR KNIVES

The Urschel Model CKG Honing Machine enables the user to duplicate the original factory edge which circular knives must have in order to cut properly.

Alternative methods of circular knife sharpening are time consuming, somewhat hazardous, and cannot provide the uniform, sharp edges produced by the Model CKG Honing Machine.

Before sharpening, inspect knives carefully for edge condition and straightness. Bent or cupped knives should be discarded. Straightening is sometimes possible but strains are often present in the metal which will cause the knife to bend again after a brief period of service.

Do not spend time cleaning and sharpening circular knives if the serrations have disappeared. Keep a few of these knives for emergency but do not use them at any other time.

Circular knives may be sharpened by the following method if the Model CKG Honing Machine is not used.

Remove the circular knife spindle assembly from the dicer and clean thoroughly. Chuck the spindle in a lathe, with the end opposite the chuck lightly supported on a live center located in the lathe tail-stock.

With the lathe spindle turning slowly, carefully sharpen the edges of the blades with a wedge-shaped file or stone. Sharpen only on the side of each blade that is not serrated. To sharpen the serrated side would soon remove the serrations and make the knives worthless. Do not remove more stock than is necessary to give a sharp edge. Usually these knives will require sharpening approximately every eight hours of continuous operation.

CIRCULAR KNIFE AND FEED ROLL SPINDLE BEARINGS

When replacing the 16114 circular knife spindle bearings, it is important to line up the grease hole in this bearing with the pressure grease fitting on the casting. The bearings should be adjusted endwise so that the circular knives center within the slots in the cutting plate. To permit the parts to heat up without binding, approximately .004" should be allowed for endwise clearance on the circular knife spindle bearings. Endwise clearance for feed roll bearings should be approximately .010".

DISASSEMBLING THE CROSS CUT SPINDLE

The parts in the cross cut knife spindle are made to the same close tolerances as the parts in a fine watch. For this reason, this part should be treated with much care.

The 15044 knife crank pins and the 15045 knife idler pins will wear out in time and need replacing. To remove these parts it is necessary to first remove both caps from the ends of the cross cut knife spindle. The 15041 cap at the crank end of the spindle must be unscrewed. This is a right hand thread. It is recommended that a plumber's chain wrench be used for removing this cap. The 15042 cross cut spindle spool drive cap at the idler end is held on by a light press fit. Three socket head cap screws go through the cap to hold the drive gear in place. After removing the three socket head cap screws, the cap can be removed by tapping lightly with a lead or plastic hammer. After removing these caps, all the parts may be removed for replacement.

The 15046 knife crank pin eccentric is held to the shaft by 12105 split dowel pin. This dowel pin should be removed by using an arbor press and pressing out the pin with a suitable pin of slightly smaller diameter. When replacing the eccentric onto the shaft, it is necessary to mount it in the proper position. One face of the eccentric contains a shoulder and the shoulder should face the long end of the shaft. If the eccentric is incorrectly placed, the cross cut knives will be tilted resulting in diamond-shaped cubes.

The crank pins and idler pins, although they are hardened stainless steel, will wear out much more quickly than the bronze bearings, 15047. However, in time it will be necessary to replace these bearings. The old bearings should be removed using an arbor press. The inside surface of the spool should be set directly against the base of the arbor press and pressure applied directly under the bearing being removed. It is important to use a good support because these spools may be easily distorted and made useless.

In time, the two cross cut spindle spool center bearings, 15055, will wear out also. The inside of the bearing has a diameter of 1" and the outside has a diameter of 1-1/2". A bearing pusher, 22447, has been made available by Urschel Laboratories. The bearing Pusher can be dropped into the inside of the spool. By using a good solid support on one end of the spool in an arbor press and by using a long rod, the bearing may be pressed out of place. After one bearing has been removed, the spool may be inverted in the arbor press and the other bearing pressed out in a similar manner.

CLEANING INTERNAL PARTS OF CROSS CUT SPINDLE

Juices from the product will seep into the ends of the knife bearings. In time, this will cause the assembly to bind. Every week or two, the cross cut spindle should be disassembled and the contamination removed from the bearings and other parts.

WEAR IN CROSS CUT SPINDLE

Movement of the cross cut knife endwise in the spindle is a normal condition and has no effect upon cutting action. If any cross cut knife is grasped so that the exposed edge could be rotated about the axis of the crank and idler pins to which it is fastened, this arc of movement should be almost imperceptible for the best quality of cutting. The amount of rotation obtainable in this manner is directly proportional to the amount of wear that has taken place at various points in the spindle, and should not be in excess of 1/32" at the edge of a new knife. If the knife can be rotated more than this amount, strips of product are scraped from the slice, rather than cleanly cut.

REPAIR PARTS

MAIN SHAFTS and FASTENERS

28508 Drive shaft, one required
28509 Conveyor drive shaft, one required
16050 Cap screw, stainless steel, hardened, 3/8-16 x 3-4", one required for fastening thrust collar 28041 to shaft 28508
28041 Thrust collar, one required for shaft 28508

DRIVE GEARS, HUBS and FASTENERS

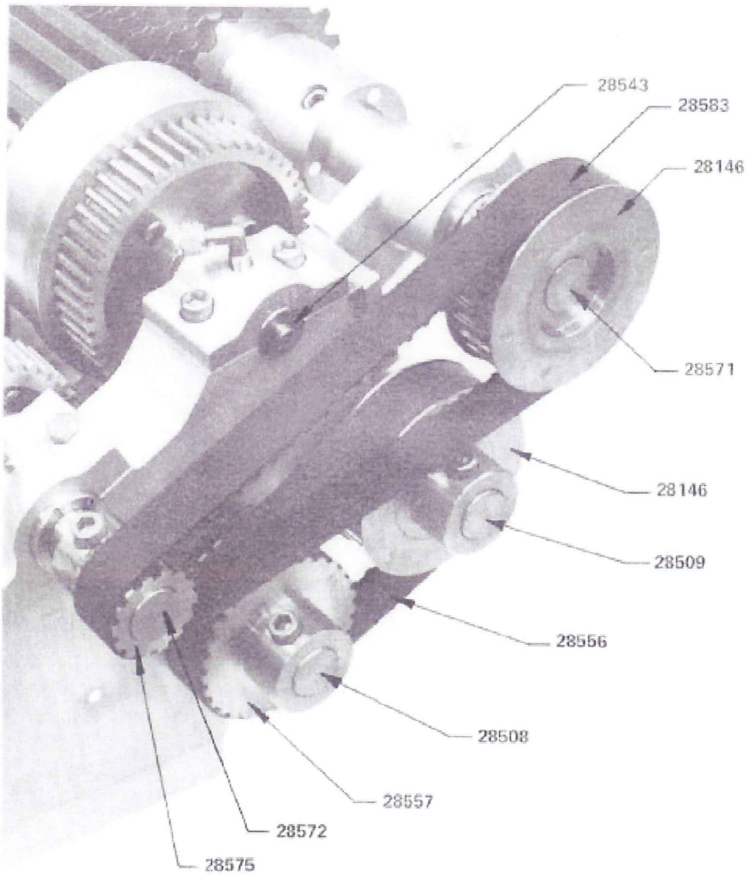
28510 Drive gear assembly consisting of one each 28511 and 28010, three each 10040 and 10020, one required
28511 Gear, one required for assembly 28510
28010 Hub, one required for assembly 28510
10040 Cap screw, stainless steel, 1/4-20 x 1-1/4", hexagon head, three required for assembly 28510
10020 Nut, stainless steel, hexagon, 1/4-20, three required for cap screws 10040 in assembly 28510
16050 Cap screw, stainless steel, hardened, 3/8-16 x 3/4", one required for fastening 28510 assembly to 28508 shaft

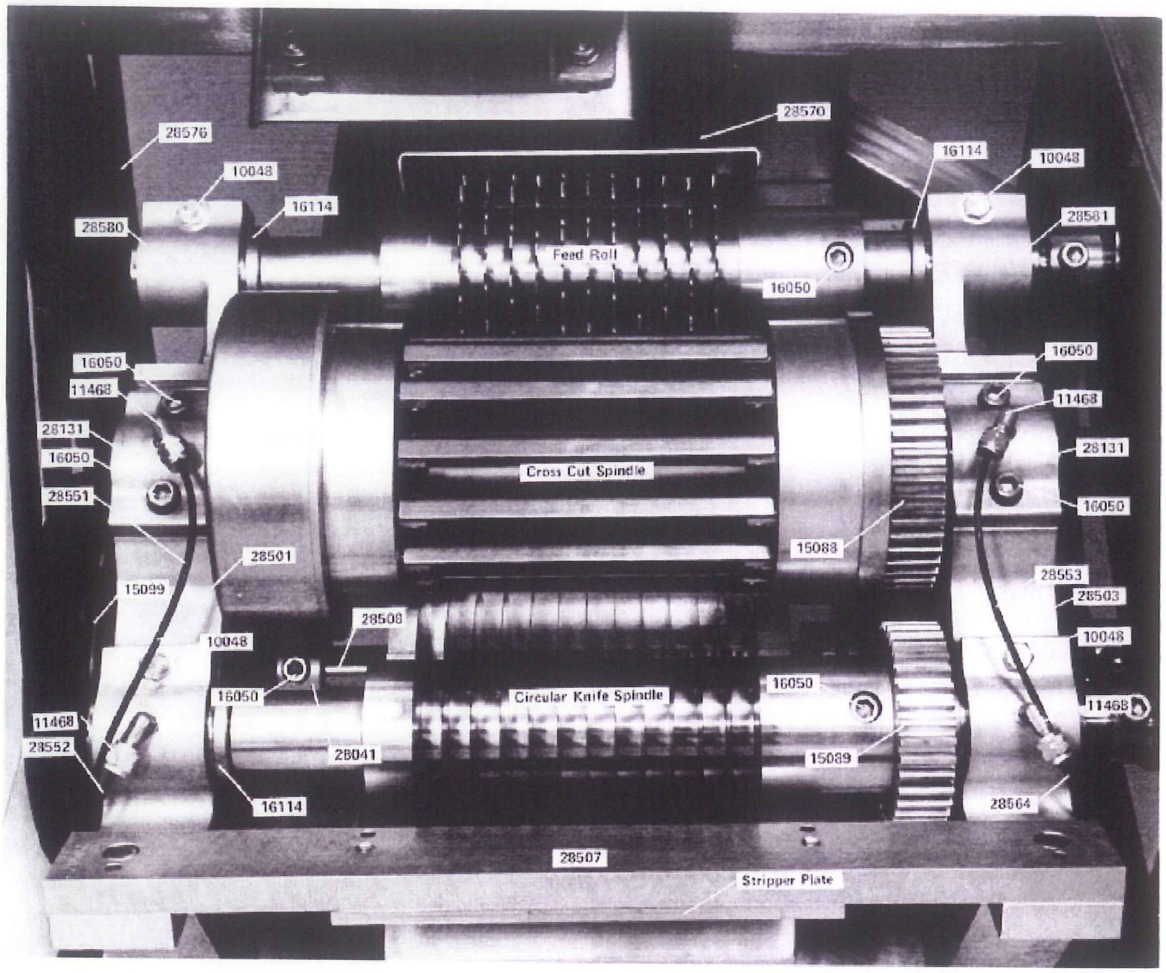
MOTOR DRIVE PARTS

15099 Pulley, two groove, one required for drive shaft 28508
12230 Key, 1/4" square x 1-1/2" long, one required for shaft 28508
12221 Pulley, two groove, one required for motor shaft
28576 Drive belts, matched set of two

PULLEYS, BELTS and FASTENERS

28557 Conveyor drive pulley, 29 teeth, one required for drive shaft 28508





28146 Conveyor drive roll pulley, 31 teeth, one required for conveyor drive shaft 28509 and one required for feed roll shaft 28571

28575 Circular knife shaft pulley, 14 teeth, one required for shaft 28572

28556 Conveyor drive belt, one required to fit over pulleys 28146 on conveyor drive shaft and 28557

28583 Feed roll timing belt, one required to fit over pulleys 28146 on feed roll shaft and 28575

16050 Cap screw, stainless steel, hardened, 3/8-16 x 3/4", four required to fasten above pulleys to shafts

SUPPORT CASTINGS, ADAPTER BLOCKS, SHEAR PLATE and FASTENERS

28505 Cutting unit base, one required

28501 Side frame assembly, right, complete with 28131 cap and fasteners 37040, 10048, 16050 and 10221, one required

28503 Side frame assembly, left, complete with 28131 cap and fasteners 37040, 10048, 16050 and 10221, one required

28004 Shear plate holder, complete with dowels 37040, one required

16114 Bearing, bronze, two required for each shaft 28509, 28508, 28572 and 28571

37040 Dowel pin, four required for assembly 28501, three required for assembly 28503 and four required for 28004

10221 Dowel pin, 1/4" x 1/2", stainless steel, two required for each side frame assembly 28501 and 28503

16050 Cap screw, stainless steel, hardened, socket head, 3/8-16 x 3/4", two required for each side frame assembly 28501 and 28503

10048 Cap screw, stainless steel, hexagon head, 5/16-18 x 1-1/4", three required for each side frame assembly 28501 and 28503

28131 Cap, one required for each side frame assembly 28501 and 28503

10072 Cap screw, stainless steel, hexagon, 1/2-13 x 1", three required to fasten cutting unit base to frame

10016 Lock washer, stainless steel, 1/2", three required to fasten cutting unit base to frame

10113	Cap screw, stainless steel, socket head, 3/8-16 x 1-1/4", four required to fasten cutting unit base to frame
10120	Cap screw, stainless steel, socket head, 1/2-13 x 1-1/4", two required to fasten each side frame 28501 and 28503 to cutting unit base 28505
28573	Adapter block, 1/8" increments, one required for each side frame assembly 28501 and 28503
28580	Feed roll bracket, right, complete with two 37040 dowel pins and one 10048 cap screw to fit on side frame assembly 28501
28581	Feed roll bracket, left, complete with two 37040 dowel pins and one 10048 cap screw to fit on side frame assembly 28503
28574	Counterbore cap screw for feed roll bracket and adapter block, two required
28582	Bracket washer, one required for each 28574 cap screw
28043	Shear plate, one required
10301	Cap screw, stainless steel, flat head socket, 5/16-18 x 1/2", two required to fasten shear plate to 28004 shear plate holder
28507	Stripper plate holder bar complete with two 37040 dowel pins, one required
37040	Dowel pin, two required for 28507 stripper plate holder bar
16050	Cap screw, stainless steel, hardened, 3/8-16 x 3/4", two required to fasten stripper plate holder bar

LUBRICATION SYSTEM - effective machine serial number 113

(See illustration on page 6)

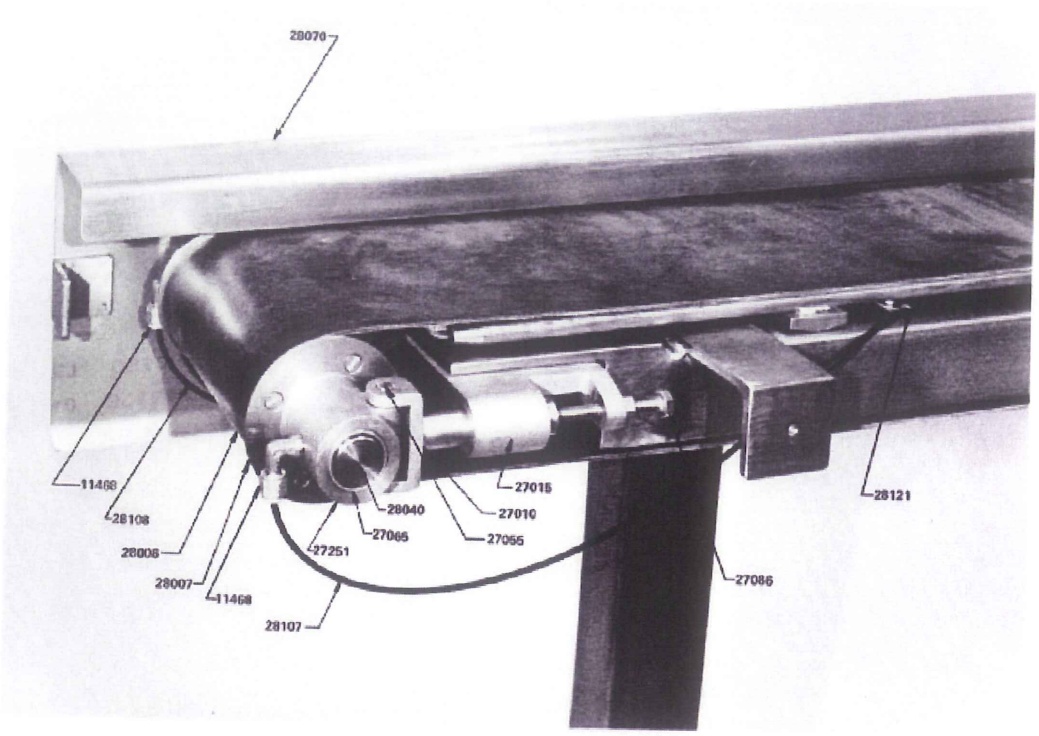
28550	Lubrication system assembly, includes all below listed parts
10224	Cap screw, stainless steel, hexagon head, 10-24 x 1/4", seven required for fastening tube clamps
27085	Tube clamps, two required
10236	Cap screw, stainless steel, hexagon head, 1/4-20 x 3/8", two required for fastening 27085
28121	Tube clamp, 1/8" single, two required
28122	Tube clamp, 1/8" duplex, five required
28107	Lubrication tube, nylon, 1/8", 59-3/4" long, one required
28108	Lubrication tube, nylon, 1/8", 57-1/2" long, one required
28551	Lubrication tube, nylon, 1/8", 46" long, one required
28552	Lubrication tube, nylon, 1/8", 42" long, one required
28585	Lubrication tube, nylon, 1/8", 36-1/2" long, one required
28553	Lubrication tube, nylon, 1/8", 32" long, one required
28110	Lubrication tube, nylon, 1/8", 31" long, two required
28564	Lubrication tube, nylon, 1/8", 28" long, one required
28113	Lubrication tube, nylon, 1/8", 16" long, two required
28114	Lubrication tube, nylon, 1/8", 11-1/2" long, one required
11401	Lubrication fitting, straight, 1/8 NPT, 12 required
11464	Bulkhead connector, female, 1/8 tube to 1/8 pipe, 12 required
11468	Elbow, seven required
11467	Connector, five required
28193	Plastic tubing, 3/8" size, black, 19" long, one required

FEED ROLL ASSEMBLY

28566	Feed roll assembly, 1/2", consisting of parts 15057, 16107, 44013, 16121 and 16004, one required
28606	Optional solid feed roll assembly, stainless steel, consisting of parts 15057, 16004 and 28201, one required
15057	Circular knife spindle, one required for either assembly 28566 or 28606
16107	Spacer, 1/2", 11 required
44013	Feed roll disc, 11 required
16121	Spacer, 5/8", one required for end of assembly 28566
16004	Circular knife spindle nut, one required for either assembly 28566 or 28606
28201	Feed roll, stainless steel, one required for assembly 28606
28571	Feed roll shaft, one required
16050	Cap screw, stainless steel, hardened, 3/8-16 x 3/4", one required to fasten feed roll to shaft

CONVEYOR ASSEMBLY and FEED BELT

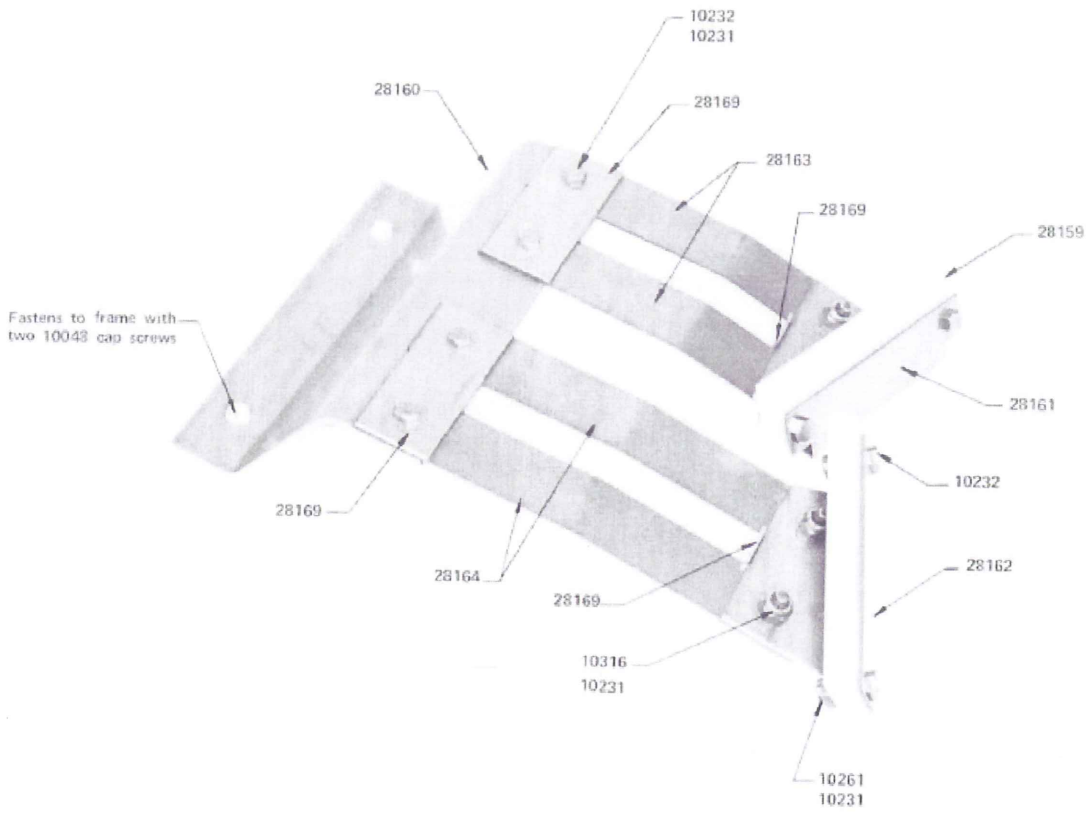
28008	Feed belt, one required
28040	Conveyor idler shaft, one required
16050	Cap screw, stainless steel, hardened, 3/8-16 x 3/4", one required for shaft 28040



27015	Conveyor take-up bracket, right, one required
27016	Conveyor take-up bracket, left, one required
27086	Cap screw, hexagon head, 5/16-18 x 1-1/2", full thread, complete with hex nut, one required for each 27015 and 27016 take-up bracket
10048	Cap screw, stainless steel, hexagon, 5/16-18 x 1-1/4", two required for each bracket 27015 and 27016
10021	Nut, stainless steel, hexagon, two required for each bracket 27015 and 27016
10008	Washer, stainless steel, 5/16", two required for each bracket 27016 and 27015
10014	Lock washer, 5/16", two required for each bracket 27015 and 27016
28134	Conveyor hinged bearing and slide assembly, complete with one each 27010, 27055 and 27251, two required
27010	Slide, one required for each assembly 28134
27251	Holder, with bearing 27065, one required for each assembly 28134
27065	Bearing, bronze, one required for each holder 27251
27055	Hinge pin, 5/16" diameter, 2-1/16" long, one required for each assembly 28134
28007	Conveyor take-up roll, one required
28035	Conveyor belt slide, one required
10047	Cap screw, stainless steel, hexagon, 5/16-18 x 1", two required to fasten conveyor belt slide 28035 (two 10048 cap screws are also required but are included as part of assembly 28158)
10021	Nut, stainless steel, hexagon, 5/16-18, four required for cap screws 10047 and 10048
10014	Lock washer, stainless steel, 5/16", four required for cap screws 10047 and 10048
28506	Conveyor drive roll, one required
16050	Cap screw, stainless steel, hardened, 3/8-16 x 3/4", one required for fastening drive roll 28506 to shaft 28509

CONVEYOR BELT CLEANER and PARTS

28158	Conveyor belt cleaner, one required
28160	Bracket, one required
28161	Blade holder, left, one required
28162	Blade holder, right, one required
28159	Blade, two required
28163	Spring, left, two required
28164	Spring, right, two required



28169 Spring clamp, four required

10316 Cap screw, stainless steel, hexagon head, 10-24 x 1/2", four required

10232 Cap screw, stainless steel, hexagon head, 10-24 x 5/8", eight required

10261 Flat washer, stainless steel, number 10, two required to fasten each 28159 to either 28161 or 28162

10231 Lock nut, stainless steel, 10-24, two required to fasten each 28159 to either 28161 or 28162, two required to fasten each 28162 and 28161 to 28164 and 28163 respectively, and two required to fasten each 28169 to 28160

10048 Cap screw, stainless steel, hexagon head, 3/16-18 x 1-1/4", two required to fasten assembly to frame

CROSS CUT KNIVES

15271 Cross cut knife, heavy duty, 12 required for spindle 28544 for 5/8" cut, nine required for spindle 28545 for 13/16" cut, eight required for spindle 28546 for 29/32" cut, five required for spindle 28587 for 1-1/2" cut

28558 Cross cut knife, special heavy duty, used for slicing thick products, nine required for spindle 28591 for 13/16" cut, eight required for spindle 28592 for 29/32" cut, six required for spindle 28593 for 1-1/4" cut, five required for spindle 28584 for 1-1/2" cut

CROSS CUT SPINDLES and PARTS

With Standard Heavy Duty Knives 15271

28544 Spindle, for 5/8" cut, complete with gear, shaft and 12 knives, six knives = 1-1/4" cut, four knives = 1-7/8" cut, three knives = 2-1/2" cut, two knives = 3-3/4" cut

28545 Spindle, for 13/16" cut, complete with gear, shaft and nine knives

28546 Spindle, for 29/32" cut, complete with gear, shaft and eight knives

28587 Spindle, for 1-1/2" cut, complete with gear, shaft and five knives

With Special Heavy Duty Knives 28558

28591 Spindle, for 13/16" cut, complete with gear, shaft and nine knives

28592 Spindle, for 29/32" cut, complete with gear, shaft and eight knives

28593 Spindle, complete with gear, shaft and 12 knives, six knives = 1-1/4" cut, four knives = 1-7/8" cut, three knives = 2-1/2" cut, two knives = 3-3/4" cut

28584 Spindle, for 1-1/2" cut, complete with gear, shaft and five knives

Parts for spindles 28544 and 28593

15036 Spindle for 5/8" cut (12 hole), with crank pin and idler pin bearings 15047

15049 Eccentric bearing plate, with 12 holes, one required for knife crank pin eccentric

Parts for spindles 28545 and 28591

15040 Spindle for 13/16" cut, with crank pin and idler pin bearings 15047

15051 Eccentric bearing plate, with nine holes, one required for knife crank pin eccentric

Parts for spindles 28546 and 28592

15038 Spindle for 29/32" cut, with crank pin and idler bearings 15047

15050 Eccentric bearing plate, with eight holes, one required for knife crank pin eccentric

Parts for spindles 28587 and 28584

15269 Spindle for 1-1/2" cut, with crank pin and idler bearings 15047

15270 Eccentric bearing plate, with five holes, one required for knife crank pin eccentric

Parts used in all spindles

15041 Cap, for knife crank pin end of spindle

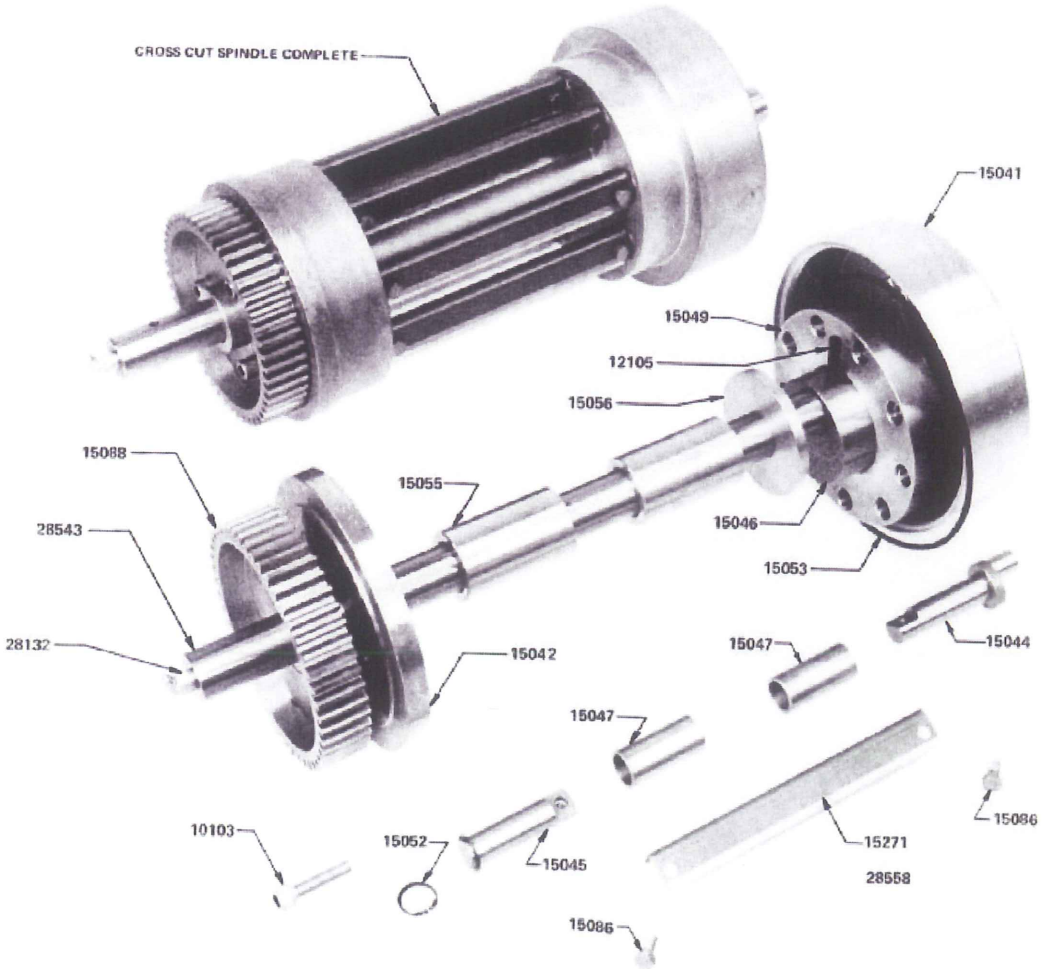
15042 Cap, for idler pin end of spindle

10103 Cap screw, stainless steel, socket head, 5/16-18 x 1-1/4", three required for fastening cap 15042 and gear 15088 to cross cut spindle

15044 Knife crank pin, one required for each knife

15045 Idler pin, with retaining ring 15052, one required for each knife

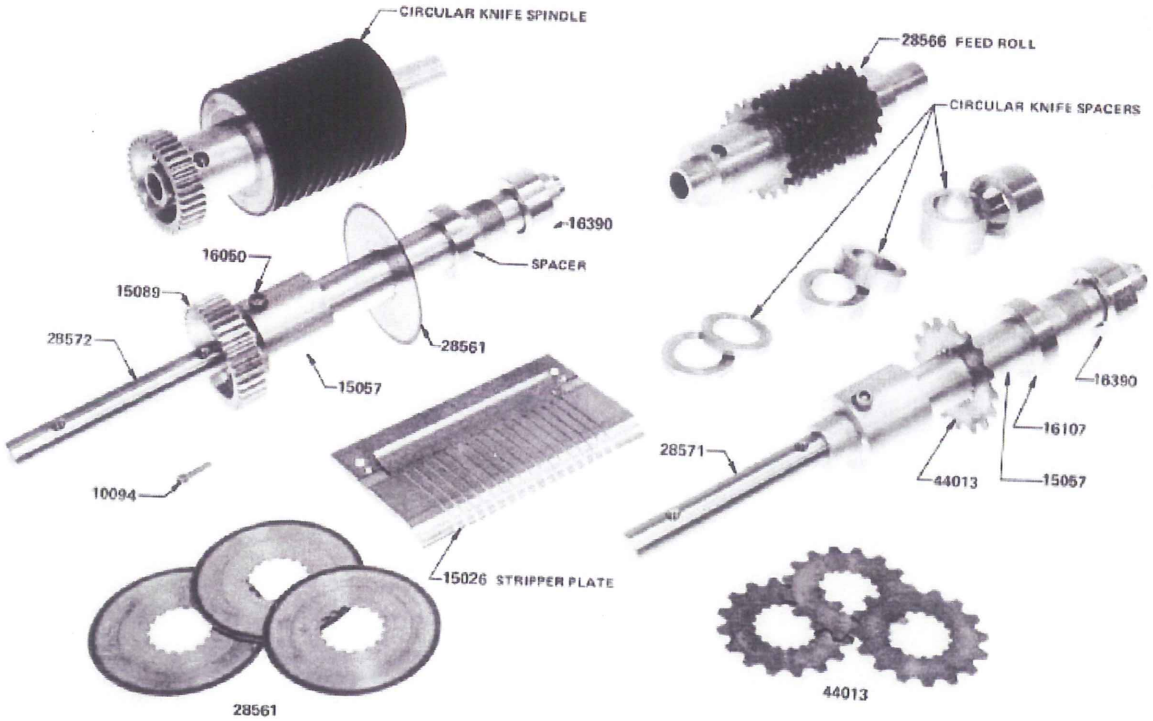
15052 Retaining ring, one required for each idler pin 15045



15086 Retaining screw, with nylon insert, two required for fastening each knife to knife pins
15047 Bearing, 5/8" x 7/8" x 1-3/4" long, one required for each cross cut knife crank and idler pins
15055 Center bearing, 1" x 1-1/2" x 2-1/2" long, two required for cross cut spindle
15046 Knife crank pin drive eccentric with roll pin 12105
12105 Roll pin, 1/4" outside diameter, 1-1/2" long, for knife crank pin drive eccentric 15046
15053 O ring seal, neoprene, one required for cap 15041
15088 Gear, bronze, 48 teeth
28543 Cross cut spindle shaft
15056 Cross cut thrust washer
28132 Pipe plug, stainless steel, 1/8", two required
28547 Bail, for removing cross cut spindle from machine, one required

CIRCULAR KNIFE SPINDLES and PARTS

28596 Circular knife spindle for 3/16" cut, complete with gear 15089, 33 knives and 32 knife spacers 16182
28597 Circular knife spindle for 1/4" cut, complete with gear 15089, 25 knives and 24 knife spacers 16105
28598 Circular knife spindle for 3/8" cut, complete with gear 15089, 17 knives, 16 feed fingers 15263 and 32 knife spacers 16182
28599 Circular knife spindle for 1/2" cut, complete with gear 15089, 13 knives, 12 feed fingers 15263 and 24 knife spacers 16105
28600 Circular knife spindle for 5/8" cut, complete with gear 15089, 11 knives, nine feed fingers 15263 and 19 knife spacers 16108
28601 Circular knife spindle for 3/4" cut, complete with gear 15089, nine knives, eight feed fingers 15263 and 16 knife spacers 16106
28602 Circular knife spindle for 1" cut, complete with gear 15089, seven knives, six feed fingers 15263 and 12 knife spacers 16107
28603 Circular knife spindle for 1-1/8" cut, complete with gear 15089, seven knives, ten feed fingers 15263 and 16 knife spacers 16106
28604 Circular knife spindle for 1-1/2" cut, complete with gear 15089, five knives, eight feed fingers 15263 and 12 knife spacers 16107



15057	Spindle, without gear, knives, knife spacers and nut
16390	Nut for circular knife spindle
15089	Drive gear
10094	Cap screw, stainless steel, socket head, 1/4-20 x 1", three required for fastening gear 15089 to spindle 15057
28572	Shaft, for circular knife spindle
16050	Cap screw, hardened, stainless steel, socket head, 3/8-16 x 3/4", one required for fastening spindle to shaft 28572
15263	Feed finger disc, used for special applications; see *"Feed Fingers"* on page 8.

CIRCULAR KNIFE

28561	Serrated circular knife, heavy duty

SPACERS

16182	Spacer for 3/16" cut, 32 required for each spindle 28596 and 28598
16105	Spacer for 1/4" cut, 24 required for each spindle 28597 and 28599
16106	Spacer for 3/8" cut, 16 required for each spindle 28601 and 28603
16107	Spacer for 1/2" cut, 12 required for each spindle 28602 and 28604
16108	Spacer for 5/16" cut, 19 required for spindle 28600

STRIPPER PLATES

15244	Stripper plate with 3/16" slots, used also for 3/8" cuts
15027	Stripper plate with 1/4" slots, used also for 1/2" cuts
15026	Stripper plate with 3/8" slots, used for 3/4" and 1-1/8" cuts
15028	Stripper plate with 1/2" slots, used for 1" and 1-1/2" cuts
15272	Stripper plate with 5/16" slots, used for 5/8" cuts
10045	Cap screw, stainless steel, hexagon head, 5/16-18 x 3/4", two required for fastening stripper plate to machine

CUTTING PLATES

28054	Cutting plate with 3/16" slots
28116	Cutting plate with 1/4" slots
28117	Cutting plate with 3/8" slots, used also for 3/4" and 1-1/8" cuts
28044	Cutting plate with 1/2" slots, used also for 1" and 1-1/2" cuts
28055	Cutting plate with 1/8" slots
10057	Cap screw, stainless steel, hexagon head, 3/8-16 x 3/4", for fastening cutting plate to machine

FRAME and MOTOR

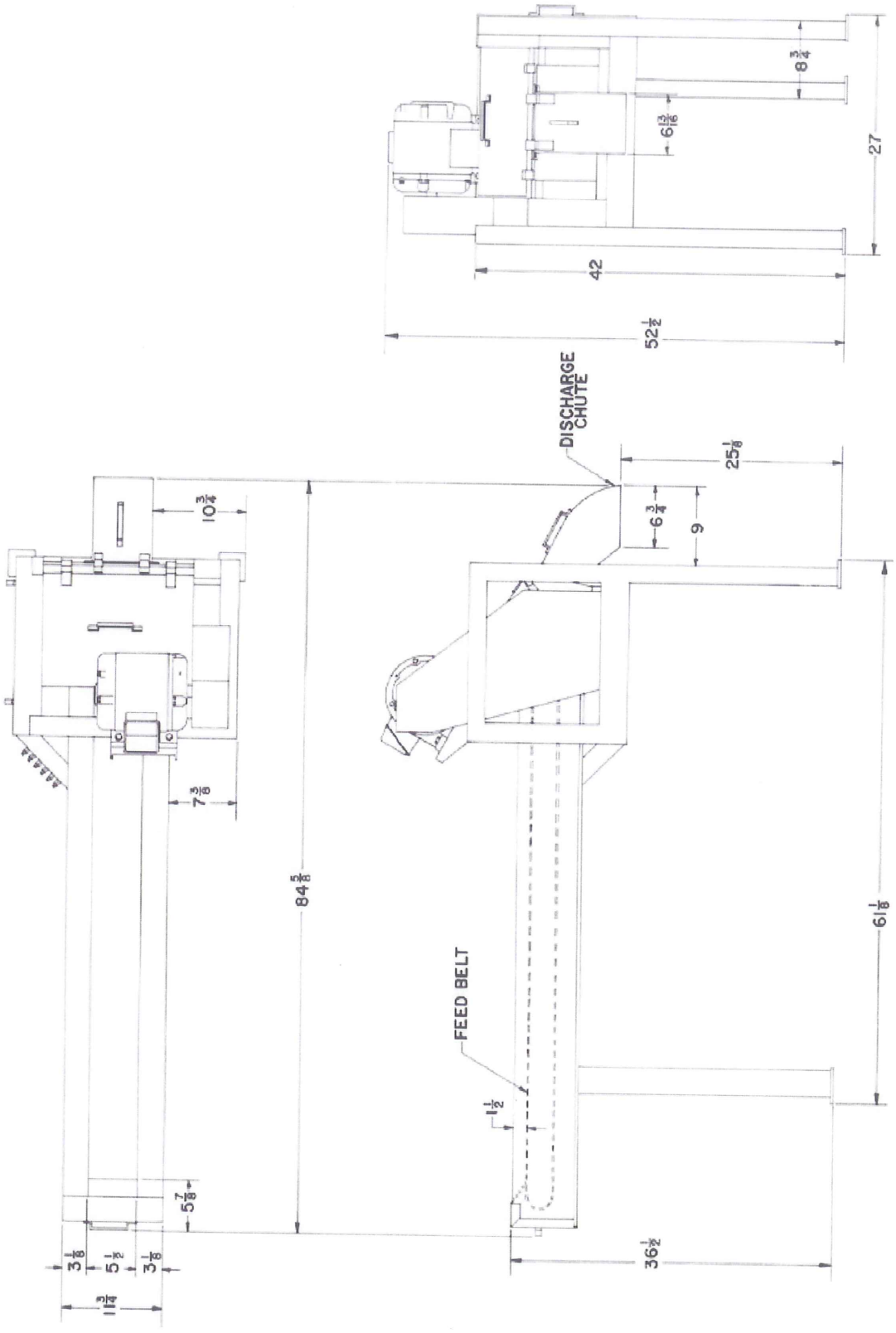
28014	Frame
12409	Motor, 1800 R.P.M., 220/440 volts, 60 Hertz, 3 Phase
10060	Cap screw, stainless steel, hexagon head, 3/8-16 x 1-1/2", four required
10022	Nut, stainless steel, hexagon, four required for cap screws 10060
10270	Washer, stainless steel, 3/8", four required for cap screws 10060
10015	Lock washer, stainless steel, 3/8", four required

DISCHARGE CHUTE, GUARDS and FASTENERS

28526	Discharge chute, one required
28515	Right product guide assembly, one required
28517	Left product guide assembly, one required
28214	Hand Knob, two required for fastening 28570 feed roll guard to product guide assemblies
28214	Hand Knob, two required for each product guide assembly
28084	End cover assembly, one required
28529	Belt guard assembly, top section, one required
28532	Belt guard, lower section, one required
10214	Machine screw, stainless steel, truss head, 1/4-20 x 3/8", one required for belt guard assembly 28529 and two required for belt guard 28532
28565	Belt guard for conveyor and feed roll pulleys,one required
28567	Dicer cover, one required
28570	Feed roll guard, one required

ACCESSORIES

11050	Hex key T handle wrench set, 5/32" across flats
11051	Hex key long wrench, 3/16" across flats
11053	Hex key long wrench, 5/16" across flats
16389	Circular knife spindle nut wrench
11003	Hex nut driver
62297	Wrench handle
11012	5/16" hex bit
11028	5/16" Box-open end combination wrench


DISCHARGE CHUTE
FEED BELT
8 3/4
6 13/16
27
42
52 1/2
25 1/8
6 3/4
9
10 3/4
7 3/8
84 5/8
61 1/8
1 1/2
5 7/8
3 1/8
5 1/2
3 1/8
11 3/4
36 1/2