

Section VI

TROUBLE SHOOTING

6.0 INTRODUCTION

Part failure of a mechanical or electrical component may occur, therefore, this section has been prepared to serve as a guide to trouble-shooting possible malfunctions.

6.1 SAFETY

The utmost in safety precautions should be observed, at all times, when working on or around the machine and the electrical components. All normal trouble-shooting must be accomplished with the Power OFF, line fuses removed, and whenever possible with the machine tagged as OUT OF SERVICE.

6.2 TEST EQUIPMENT

The use of good quality test equipment cannot be over-emphasized, when trouble-shooting is indicated. Secure a good ammeter that can measure at least twice the AC and DC current that can be encountered for the machine. Be sure that the voltmeter has at least a minimum impedance of 5,000 OHMS-per-volt on AC and 20,000 OHMS-per-volt on DC scales. Popular combination meters, VOM and VTVM, can be selected to provide the necessary functions.

6.3 LOCATING THE TROUBLE

Before making haphazard substitutions and repairs when defective electrical components are malfunctioning, it is recommended that you check the associated circuitry, and assemblies for other defective devices. It is not too uncommon to replace the obviously damaged component without actually locating the real cause of trouble. Such hasty substitutions will only destroy the "new" component. Refer to wiring diagrams and schematics.

Locating of mechanical problems, should they occur, are relatively straightforward. When necessary, refer to the Parts Catalog section.

6.4 TROUBLE-SHOOTING CHART

Trouble-shooting procedures are listed in tabular form in Table 6-1. The first column lists the apparent problem or symptom, the second column contains the probable cause, and the suggested remedy is listed in the third column.

TABLE 6-1. TROUBLE-SHOOTING CHART

PROBLEM	PROBABLE CAUSE	REMEDY
Processing Faults		
A. Stalling	1. Overfeeding. 2. Partial or complete screen blockage. 3. Insufficient tension on V-belt drive causing belt slippage and burning.	1. Reduce feed rate. 2. Remove screen, clear, and inspect for damage. 3. Check tension of belt and adjust as necessary. Check that motor slide base screws are secure.

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PROBLEM	PROBABLE CAUSE	REMEDY
Processing Faults (contd.)		
A. Stalling (contd.)		
	4. Badly blunted or damaged knives.	4. Fit re-sharpened or new knives as required.
	5. Knife setting too wide.	5. Check clearances given and adjust as required.
	6. Installation fault, motor running in reverse direction.	6. Remove right hand cover, check with directional arrow and reset electrical connections to give correct rotational direction.
	7. Safety switch cut out where fitted.	7. Tighten safety switch setting screw.
B. Material Overheating		
	1. Check items 1, 2, 4, 5 and 6 under "Stalling".	1. Remedy as given for those items.
	2. Overfeeding:-Refer to item 1 under "Stalling".	2. Do not allow a head of material to build up in a hopper.
	3. Screen size too small.	3. Increase screen size.
	4. (When feeding sheet material) – Bed knife shield on rotor down-stroke incorrectly set.	4. Check bed knife projection beyond shield. Set as necessary.
	5. When granulating rubber, insufficient talc causing freshly cut surfaces to re-adhere.	5. Increase talc percentage rate of infeed.
	6. (Where fitted) – Blockage is in Airvkeying.	6. Check direction of fan rotation. Check venturi and line/or transition piece for blockage.
Mechanical Faults		
A. Bearing Overheating		
	1. Excessive tension on V-belt drive.	1. Check tension of belt and adjust as necessary. Check lubrication frequency and the recommended lubricant (except pre-packed bearings).

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PROBLEM	PROBABLE CAUSE	REMEDY
Mechanical Faults (contd.)		
B. Visible Cracks in knives	1. This is a sign of incorrect grinding procedure or that incorrect grinding wheels are being used.	1. Check method of grinding and contact a Cumberland service engineer.
C. Knives moving on knife seats	1. Uneven knife seat surfaces. 2. Loose knife screws. 3. Stretched knife screws.	1. Clean up to provide maximum bearing surface. 2. Tighten to correct torque. 3. Knife screws should not be used more than six times. Renew if there is evidence of stretching.
D. Knives Breaking	1. Due to cracks caused by incorrect grinding. 2. Abnormally heavy material.	1. See under B, "Visible Cracks in Knives" above. 2. Contact a Cumberland service engineer.
E. Excessive Knife Wear	1. Open knife setting. 2. Abrasive materials.	1. Reset as detailed in Section III. 2. Contact a Cumberland service engineer for an alternate.
F. Screens Wearing	1. Incorrectly seated.	1. Check that screen is seated correctly and fully on its cradle.
Electrical Faults		
A. Motor Fails to Start	1. Power supply failure. 2. Starter inoperative. 3. Starter overloads cut out. 4. Safety switches inoperative.	1. Check fuses. 2. Check Mains Supply. Check starter contacts for burning, replace if necessary. 3. Check motor requirements and adjust accordingly. 4. Check and adjust as needed.

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PROBLEM

Electrical Faults (contd.)

B. Motor Starts But Will
Not Take Loads

PROBABLE CAUSE

1. Too much belt tension.
2. Incorrectly connected motor.
3. Defective Starter Winding.

REMEDY

1. Check belt tension and adjust as necessary.
2. Check terminal connection with Manufacturer's connection diagram and adjust as necessary.
3. Check current in each phase with an Ammeter. If there is marked difference in current in any one phase, contact the motor Manufacturer.

C. Motor Will Start
When Disconnected
From Load But Not
When Connected

1. Worn bearings.

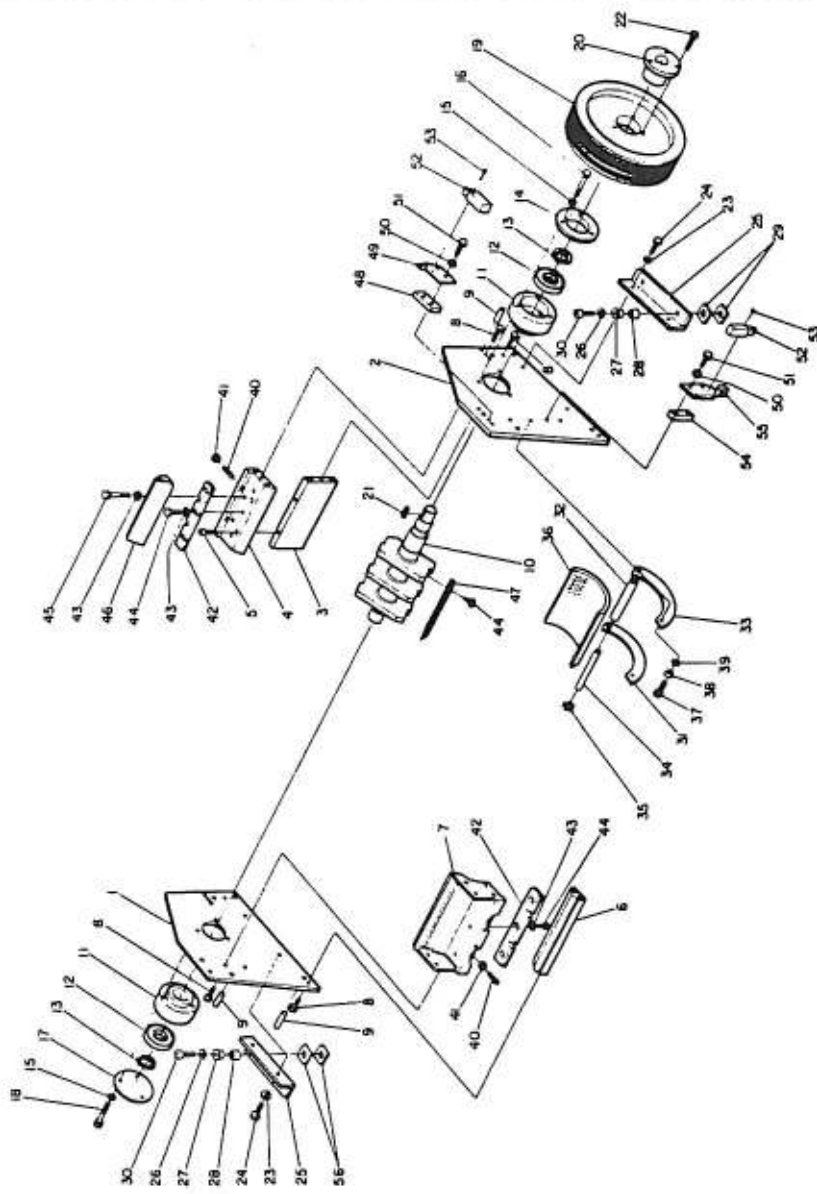
1. Check and replace if necessary, in accordance with Manufacturer's literature.

Section VII RECOMMENDED SPARES

7.0 RECOMMENDED SPARES LIST

When alternative items or quantities are listed, consult the Specification Sheet in SECTION II, to determine the exact item or quantity required.

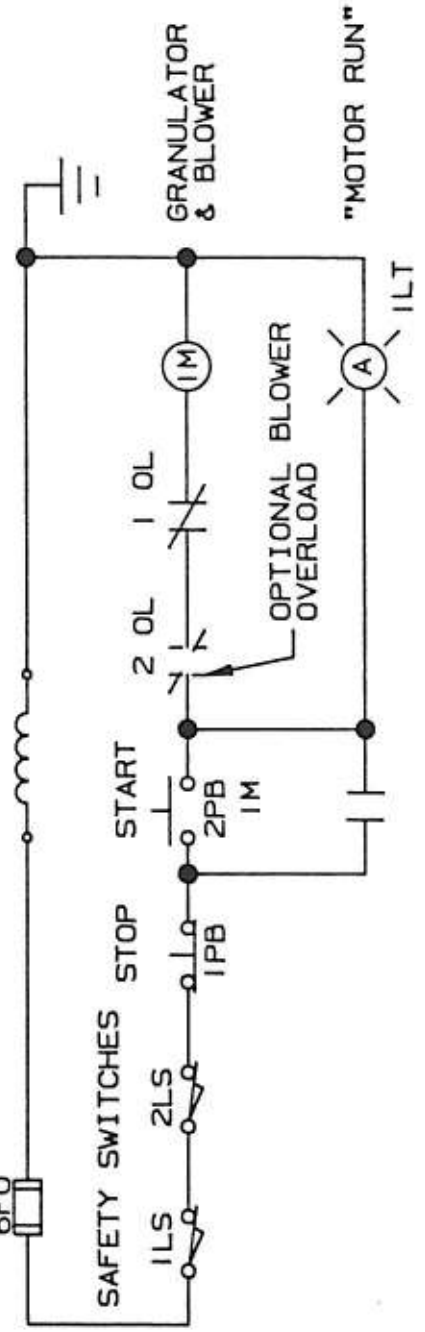
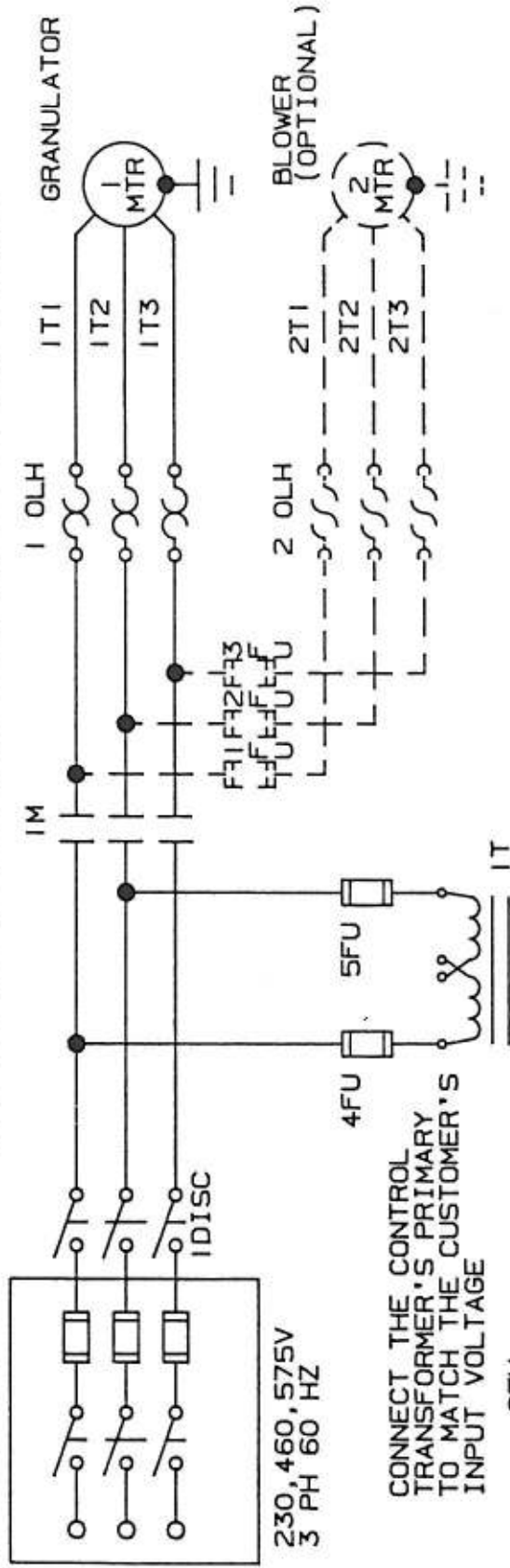
ITEM	QTY	DIMENSIONS	MATERIAL SPECIFICATIONS	PART NUMBER
Rotor Knives -55°	2	Standard	HCHC	B-239135
Bed Knives	2	Standard	HCHC	B-239104
Rotor Knife Screws	6		Heat Treated	15030-115
Bed Knife Screws	6		Heat Treated	15030-115
Bed Knife Washers	6			C-39940
Screens	1		Mild Steel or Stainless Steel	A-239098 + Hole Size
Rotor Bearings	2			12391-15
Drive Belts				



ILLUSTRATED PARTS BREAKDOWN (CUTTING CHAMBER)

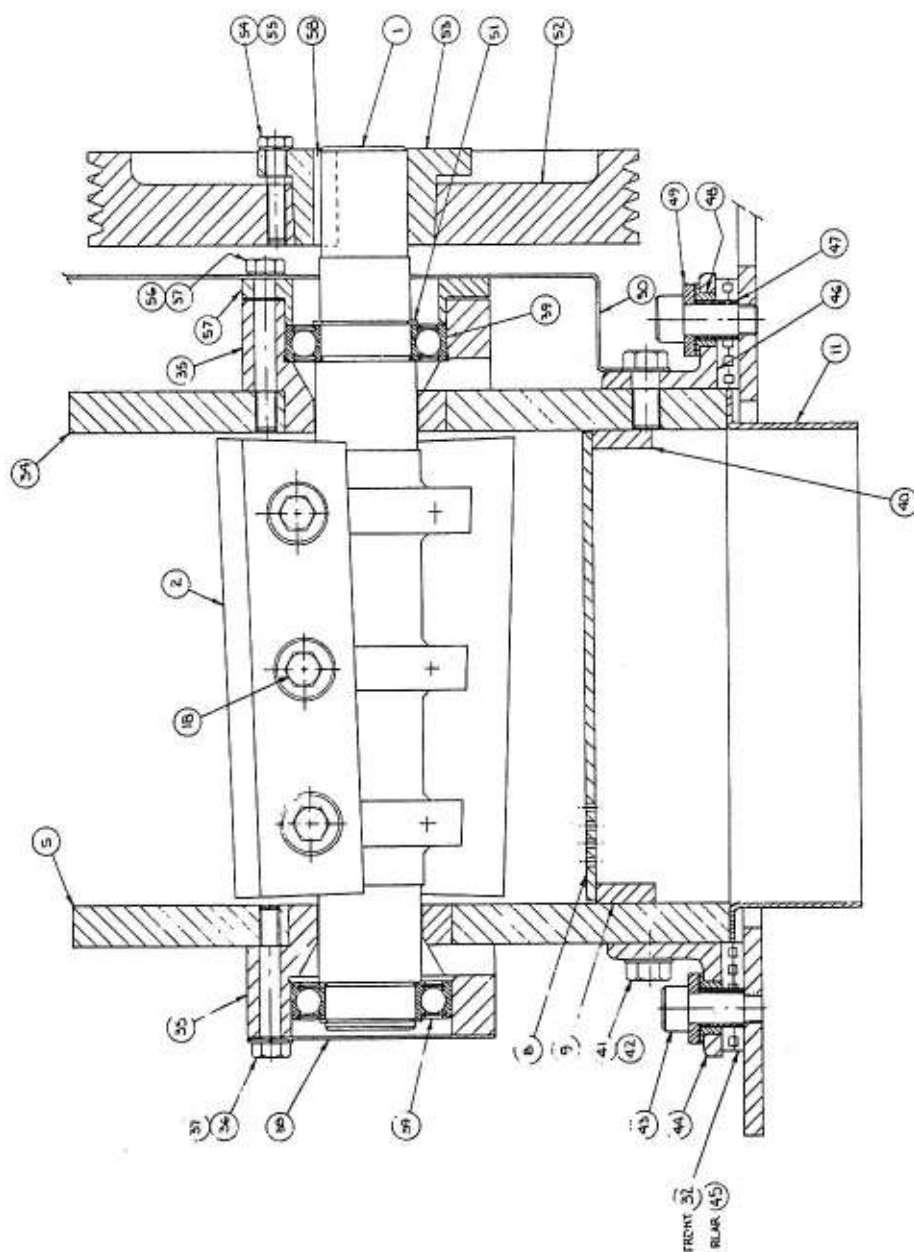
Key No.	Part No.	Part Name
1	A-239087	Side Plate - L.H.
2	A-239088	Side Plate - R.H.
3	B-239093	Rear Block - Lower
4	B-239092	Rear Block - Rear
5	15008-316	Screw, Soc. Hd. Cap, M12 x 1.75-6g x 35 Lg.
6	B-239097	Front Block - Lower
7	A-239096	Shield - Front Knife Block
8	15033-235	Screw, Hex. Hd. Cap, M12 x 1.75-6g x 50 Lg.
9	15153-210	Dowel, 18 Dia. x 45 Lg.
10	BM239157	Rotor
11	B-239089	Bearing Housing
12	12391-15	Bearing
13	12595-50	Retaining Ring
14	C-239090	Bearing Cap - R.H.
15	15134-11	Lockwasher, M12
16	15033-247	Screw, Hex. Hd. Cap, M12 x 1.75-6g x 85 Lg.
17	C-239091	Bearing Cap - End
18	15033-243	Screw, Hex. Hd. Cap, M12 x 1.75-6g x 75 Lg.
19	B-39894	Sleeve, Flywheel
20	C-239115	Taper Bushing
21	D-239100	Key - Bushing
22	15033-161	Screw, Hex. Hd. Cap
23	15148-16	Washer, Wavy
24	15033-447	Screw, Hex. Hd. Cap, M16 x 2-6g x 35 Lg.
25	C-39934	Angle, Mounting - R.H.
26	D-421101	Washer
27	D-421102	Bushing, Mounting
28	D-42110	Spacer, Mounting
29	D-235244	Pad, Mounting, Front
30	15008-499	Cradle Arm - L.H.
31	A-239099	Screw, Soc. Hd. Cap, M16 x 2-6h x 50 Lg.
32	C-239106	Spacer Tube
33	A-239101	Cradle Arm - R.H.
34	D-239109	Pivot Shaft
35	15673-75	Ring - Self Locking
36	Optional	Screen
37	D-239111	Screw - Altered
38	C-239102	Locating Washer
39	12596-25	Ring, Retaining
40	15088-5	Set Screw
41	15115-13	Hex Nut, M10 x 1.5
42	Optional	Red Knife
43	C-39940-12	Washer
44	15030-115	Knife Bolt
45	15030-143	Screw, Hex. Hd. Cap - Heat Treated, M12 x 1.75-6g x 50 Lg.
46	A-239095	Shield, Rear
47	Optional	Rotor Knife
48	D-39947	Spacer, Safety Switch
49	B-39346	Bracket, Topper Safety Switch
50		Lockwasher, M10
51	15033-101	Screw, Hex. Hd. Cap, M10 x 1.5-6g x 40 Lg.
52	12668-10	Limit Switch
53	12008-140	Screw, Soc. Hd. Cap, #10-32 x 2" Lg.
54	D-421383	Spacer, Limit Switch Bracket
55	B-421256	Bracket, Front Cover Safety Switch
56	D-39939	Pad, Mounting, Rear

FUSIBLE DISCONNECT (BY OTHERS) CUSTOMER MUST COMPLY WITH THE LATEST NATIONAL ELECTRIC CODE AND ANY LOCAL CODES WHEN WIRING TO THIS MACHINE

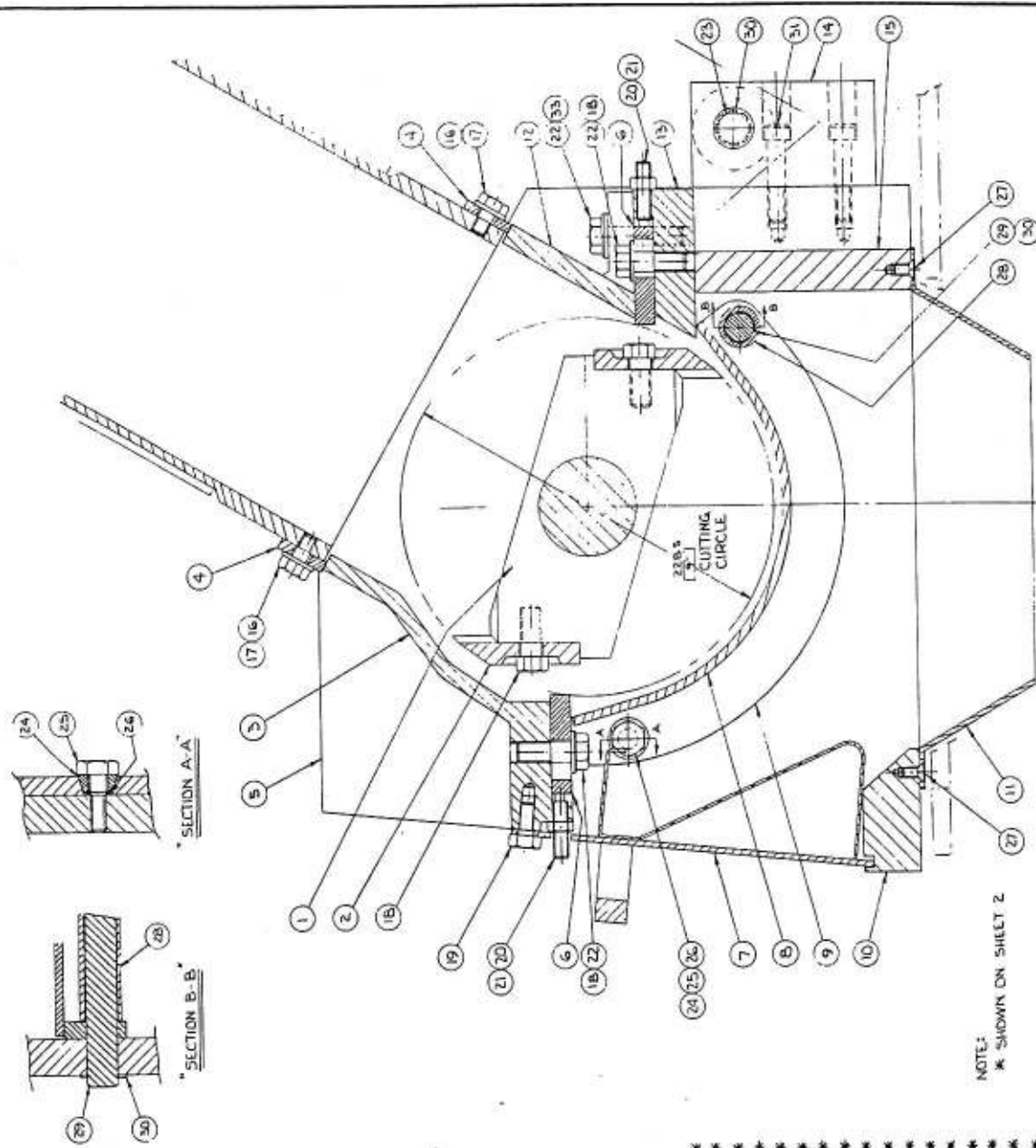


SECTION IX WIRING DIAGRAM

LONGITUDINAL CROSS SECTION



BILL OF MATERIALS			REMARKS
ITEM	QTY	PART NO. DESCRIPTION	
1	1	BA-239157 ROTOR - 2 KNIFE SA	
2	2	OPTIONAL KNIFE-ROTOR	
3	1	A-239096 KNIFE BLOCK & SHIELD	
4	2	D-339092 SEAL STRIP	
5	1	A-239087 SIDE PLATE - L.H.	
6	2	OPTIONAL BLD KNIFE	
7	1	A-239107 FRONT COVER ASSEMBLY	
8	1	A-239098 SCREEN-NKT.	HOLE TABULATED TO SUIT.
9	1	A-239099 CRADLE ARM - L.H.	
10	1	B-239097 LOWER BLOCK - FRONT	
11	1	A-239171 CHUTE - DISCHARGE	
12	1	A-239095 REAR SHIELD	
13	1	B-239092 KNIFE BLOCK-REAR	
14	2	B-39992 PIVOT BLOCK-HOPPER	
15	1	B-239093 LOWER BLOCK-REAR	
16	6	15025-29 SCREW-R.H.C.	MID-1.5-6g-20 Lg.
17	6	15141-9 WASHER-PLAIN	MID
18	12	15030-115 SCREW-H.H.C. HT.	M12-1.75-6g-35 Lg.
19	2	15033-219 SCREW-H.H.C.	M12-1.75-5g-20 Lg.
20	4	15085-5 SCREW-SHS FULL DOGS	M10-1.5-6g-35 Lg.
21	4	15115-13 NUT-HEX	M10-1.5
22	8	C-39940-72 WASHER-HARDENED	M12
23	2	D-239075 PIN - HOPPER PIVOT	
24	2	C-239102 LOCATING WASHER	
25	2	D-239111 ALTERNAT. 2nd SCREW	TRUARC * 5/07-46
26	2	12596-25 INTERLOCKING EXT. RING	M16-1-6g-16 Lg.
27	6	15073-3 SCREW-FIN'S C.	
28	1	C-239106 SPACER TUBE	
29	1	D-239109 PIVOT SHAFT	
30	4	15073-75 SELF LOCKING RING	TRUARC * 5/15-75
31	4	15003-309 SCREW-S.H.C. A.S.	MID-1.5-6g-50 Lg.
32	4	D-325244 PAC-VIBRATION	FRONT
33	2	15033-143 SCREW-H.H.C. HT.	M12-1.75-6g-50 Lg.
34	1	A-239058 SIDE PLATE - R.H.	
35	2	B-239089 BEARING HOUSING	
36	3	15033-243 SCREW-H.H.C.	M12-1.75-6g-75 Lg.
37	6	15134-11 WASHER-LOCK	M12
38	2	C-239291 BEARING CAP- END	
39	2	12391-15 BEARING	NO. Z-99510
40	1	A-239101 CRADLE ARM - RH	
41	4	15148-16 WASHER-SPRING	M16
42	4	15033-447 SCREW-H.H.C.	M16-2-6g-35 Lg.
43	4	15038-199 SCREW-S.H.C.	M16-2-6g-50 Lg.
44	1	C-39925 ANGLE MOUNTING, L.H.	REAR
45	4	D-39939 PAD-VIBRATION	
46	1	C-39934 ANGLE MOUNTING, R.H.	
47	4	D-42100 SPACER MOUNTING	
48	4	D-42102 BUSHING MOUNTING	
49	4	D-42101 WASHER	
50	1	A-239112 SEAL PLATE-BELT GUARD	
51	2	12595-5 RETAINING RING	TRU-ARC * 5100-196
52	1	B-39894 SHEAVE-FLYWHEEL	
53	1	C-239115 BUSHING - 4.8 BORE	
54	3	15033-161 SCREW-R.H.C.	M10-1.5-6g-50 Lg.
55	3	15134-9 WASHER-LOCK	M10
56	3	15033-247 SCREW-H.H.C.	M12-1.75-6g-85 Lg.
57	1	C-239093 BEARING CAP-R.H.	
58	1	D-239103 KEY-BUSHING	



Section X
VERTICAL CROSS SECTION

NOTE:
* SHOWN ON SHEET Z

RECOMMENDED GRANULATOR MOTOR BRANCH-CIRCUIT SHORT-CIRCUIT PROTECTION PER THE
 1996 NEC CODE BOOK RULES
 FOR STANDARD EFFICIENCY MOTORS* (NEMA DESIGN B,C,&D)

HORSEPOWER	VOLTAGE	TIME DELAY FUSES	CIRCUIT BREAKER		MOTOR CIRCUIT PROT.	
			AUTO TRANS	ACROSS THE LINE	AMP RATING	TRIP RANGE
50	200	300A	400A	400A	400A	875-1750A
	208	250A	400A	400A	400A	875-1750A
	230	250A	350A	350A	250A	625-1250A
	460	125A	175A	175A	100A	300-1000A
	575	100A	150A	150A	100A	300-1000A
60	200	350A	450A	450A	400A	875-1750A
	208	300A	450A	450A	400A	875-1750A
	230	300A	400A	400A	400A	875-1750A
	460	150A	200A	200A	150A	450-1550A
	575	125A	175A	175A	100A	300-1000A
75	200	400A	600A	600A	NOT RECOMMENDED	
	208	400A	500A	500A	NOT RECOMMENDED	
	230	350A	500A	500A	NOT RECOMMENDED	
	460	175A	250A	250A	250A	500-1000A
	575	150A	200A	200A	150A	450-1550A
100	200	500A	800A	800A	NOT RECOMMENDED	
	208	500A	700A	700A	NOT RECOMMENDED	
	230	500A	600A	600A	NOT RECOMMENDED	
	460	225A	350A	350A	400A	625-1250A
	575	200A	250A	250A	150A	450-1550A
125	200	600A	800A	800A	NOT RECOMMENDED	
	208	600A	800A	800A	NOT RECOMMENDED	
	230	500A	800A	800A	NOT RECOMMENDED	
	460	300A	400A	400A	400A	875-1750A
	575	225A	300A	300A	400A	625-1250A
150	200	800A	1200A	1200A	NOT RECOMMENDED	
	208	800A	1000A	1000A	NOT RECOMMENDED	
	230	700A	1000A	1000A	NOT RECOMMENDED	
	460	350A	500A	500A	400A	1000-2000A
	575	300A	400A	400A	400A	625-1250A
200	200	1000A	1400A	1400A	NOT RECOMMENDED	
	208	1000A	1400A	1400A	NOT RECOMMENDED	
	230	800A	1200A	1200A	NOT RECOMMENDED	
	460	450A	600A	600A	NOT RECOMMENDED	
	575	350A	500A	500A	NOT RECOMMENDED	
250	200	1200A	2000A	2000A	NOT RECOMMENDED	
	208	1200A	2000A	2000A	NOT RECOMMENDED	
	230	1200A	1600A	1600A	NOT RECOMMENDED	
	460	500A	800A	800A	NOT RECOMMENDED	
	575	400A	600A	600A	NOT RECOMMENDED	
300	200	1500A	2000A	2000A	NOT RECOMMENDED	
	208	1500A	2000A	2000A	NOT RECOMMENDED	
	230	1200A	2000A	2000A	NOT RECOMMENDED	
	460	650A	1000A	1000A	NOT RECOMMENDED	
	575	500A	800A	800A	NOT RECOMMENDED	

* FOR ENERGY EFFICIENT MOTORS AND OTHER SPECIAL TYPES OF MOTORS CONSULT FACTORY FOR PROPER SIZING OF DISCONNECTS SWITCHES.

WHEN CONTROLS ARE FURNISHED BY THE CUSTOMER, CUMBERLAND BEARS NO RESPONSIBILITY OF IMPROPER SIZING OF DISCONNECT SWITCHES AND STARTERS UNLESS THE CUSTOMER REQUESTS MOTOR INFORMATION AND/OR ASKS FOR ENGINEERING ASSISTANCE IN SELECTING THE PROPER DISCONNECTS AND STARTERS.

