OPERATION, PARTS AND SAFETY MANUAL

SIGNODE®

MCD-710/510/310

POWER STRAPPING MACHINES
&
MCD MODULAR CHUTE SYSTEM

IMPORTANT!
DO NOT DESTROY

It is the customer's responsibility to have all operators and servicemen read and understand this manual.

Contact your local Signode representative for additional copies of this manual.

READ ALL INSTRUCTIONS BEFORE OPERATING THIS SIGNODE PRODUCT

⚠ SAFETY INSTRUCTIONS

WARNING - READ AND FOLLOW THESE INSTRUCTIONS - FAILURE TO DO THIS COULD RESULT IN SEVERE PERSONAL INJURY.

OPERATING INSTRUCTIONS

1. **Only people trained in the use of strapping machines are to operate or service this machine.**
2. **Read all signs on machine. Do not remove, modify or deface any sign. Replace all damaged signs.**
3. **Inspect the machine for unsafe conditions - DAILY - and replace all worn or broken parts.**
4. **Keep work area uncluttered and well lit.**
5. **If you require safety instructions in another language, contact your local Signode representative.**

MAINTENANCE 

1. **Establish a preventive maintenance program for your machine by following the preventive maintenance program in this manual.**
2. **To ensure proper machine operation, use the specified power sources listed in this manual.**
3. **Do not overload the machine by exceeding the package size specification.**
4. **Remove all packages from the machine before performing service.**
5. **Unless otherwise noted in this manual, disconnect and lockout all power before servicing your machine.**
6. **Follow all maintenance and service instructions in this manual.**

MOVING MACHINE PARTS 

1. **Disconnect and lock out all power to Signode's machines before entering the strap chute area.**
2. **Never put any part of your body into the strap chute area or machine enclosure with machine power on.**
3. **Never stand on the conveyors.**

MACHINE INSTALLATION

1. **All customer interlocks must be connected as shown in this manual's electrical drawings. Failure to properly connect interlocks can result in improper machine operation and/or personal injury.**

2. **Be familiar with the locations of safety interlocks/guards and Emergency Stop Devices - refer to machine manual topic "Disconnect & Lockout Procedures".**

3. **Do not defeat any safety interlock or safety device. Do not operate machine with any safety devices/guards removed.**

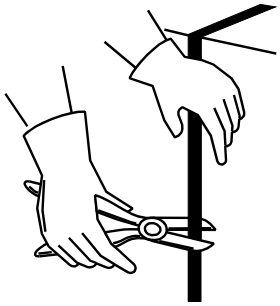
4. **Before operating the machine, ensure that all safety interlocks and Emergency Stop buttons are operating properly.**

5. **Do not attempt to alter machine design unless written approval is recieved from Signode. Unauthorized modifications can present a safety hazard to machine personnel and will void the machine warranty.**

PERSONAL PROTECTION

1. **Before loading a coil of strap into a Signode dispenser, follow recommended lifting techniques as established by the National Safety Council, Itasca, Illinois.**

2. **When removing tensioned strap from a package, proceed as follows:**
   a. **Wear eye, face and hand protection**
   b. **Before cutting strap, make sure all personnel are at a safe distance.**
   c. **Hold the strap against the load above the cutter as shown.**
   d. **Using the proper Signode strap cutter, cut strap as pictured.**
   e. **Stand clear of unheld strap end which will spring out if under pressure.**



3. **Always wear steel reinforced safety shoes.**

4. **Always wear safety glasses with side shields which conform to ANSI Standard Z-87.1 or EN 166**

5. **Always wear protective gloves when handling strap.**

LOCKOUT/TAGOUT

1. **Follow OSHA 1910.147 (Lockout/Tagout Regulation) for machine lockout procedures and other important lockout/tagout guidelines.**

2. **Be familiar with all lockout sources on this machine, refer to the "Lockout & Tagout" section of this manual.**

TABLE OF CONTENTS

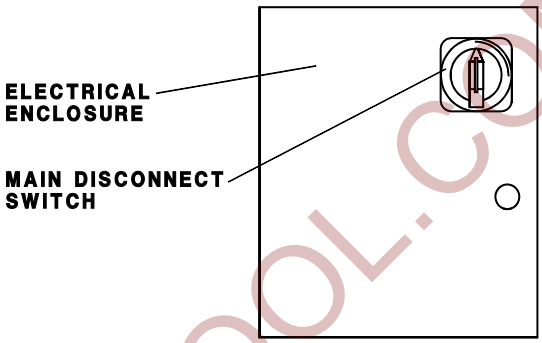
INTRODUCTION

The placement of the welding head on the side of the MCD makes possible a lower conveyor height, an easier fit into an existing conveyor system, handier servicing, and locates the weld where it is more convenient to pull open. The MCD automatically makes a strong weld in Contrax® or Tenax® co-polymer strapping, joining the ends without seals, adhesives, or solvents, and without applied heat or electricity. The process utilizes Tension-Weld®, is clean - no smoke or odor, no grit to cause wear, no heaters to carbonize. Tension-Weld is a development so unique that the process, machine and weld have been patented.

DISCONNECT AND LOCK-OUT PROCEDURES

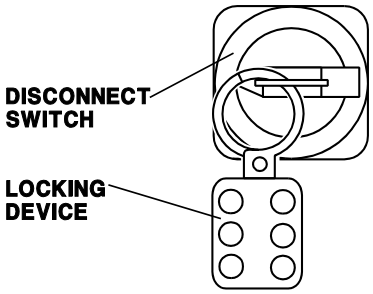
DISCONNECT SWITCH

The main disconnect switch is located on the front of the electrical enclosure.



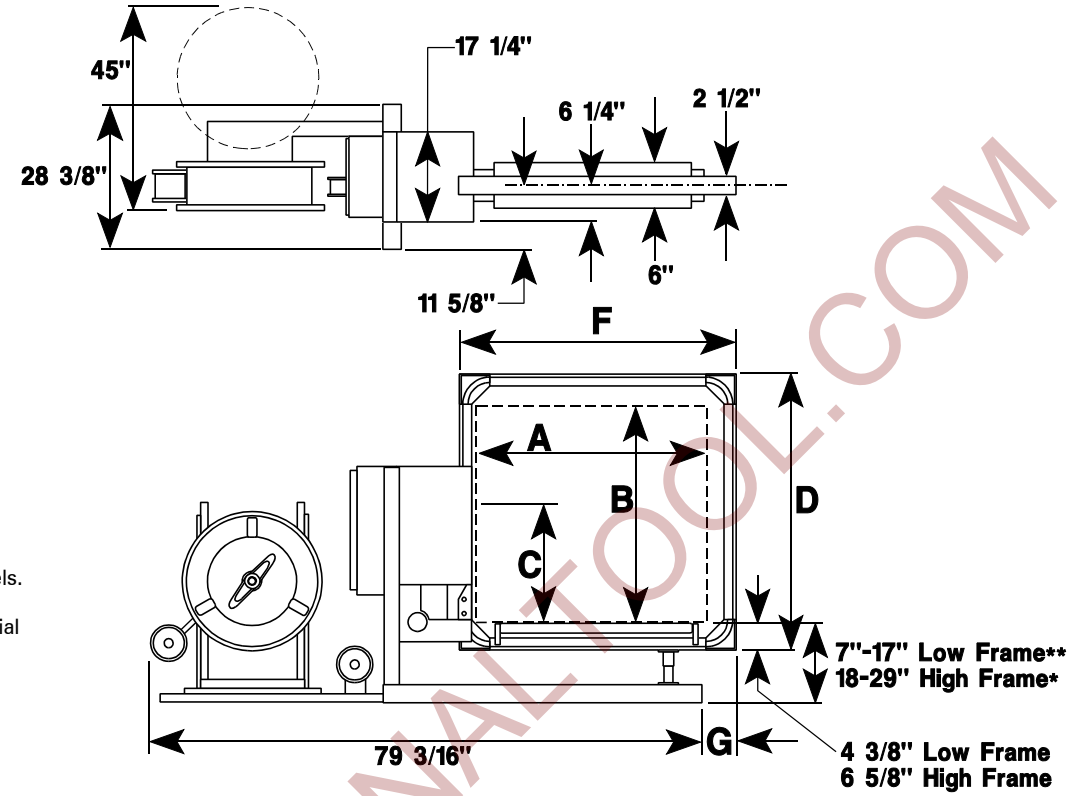
To disconnect/lock-out electrical power to the machine, proceed as follows:

- Switch the main disconnect switch to the OFF position.
- Locate an appropriate locking hole on the switch, more than one may be provided, and apply a locking device.



- Confirm that power has been disconnected by pulling out machine start button (return button to stop position).

SPECIFICATIONS



- MAX. PACKAGING SPEED:
  575-1300 straps per hour, depending on package size
- STRAP FEED SPEED:
  5.3 feet per second
- DISPENSER:
  Model DF1-12D
- POWER:
  208/230/460V standard.
  575V optional for most models.

  NOTE: 208V Requires a special electrical transformer.

NOTE: Chute sizes are any combination of Width (A) and Height (B) shown below.

	PACKAGE WIDTH (A)						
	18"	24"	30"	36"	48"	60"	72"
CHUTE LENGTH (F)	26 9/16"	32 9/16"	38 9/16"	44 9/16"	56 9/16"	68 9/16"	80 9/16"
CHUTE OVER-HANG, LOW FRAME (G)	NONE	2 15/16"	8 15/16"	14 15/16"	NONE	10 3/16"	2 3/16"
CHUTE OVER-HANG, HIGH FRAME (G)	NONE	3"	9"	15"	NONE	10 1/4"	2 1/4"

	PACKAGE HEIGHT (B)						
	18" HF*	24" HF*	30" LF**	36" LF**	48" LF**	60" LF**	72" LF**
MINIMUM PACKAGE HEIGHT (C)	4"	4"	17 3/4" †	17 3/4" †	17 3/4" †	17 3/4" †	17 3/4" †
CHUTE HEIGHT (D)	30 5/16"	36 5/16"	39 9/16"	45 9/16"	57 9/16"	69 9/16"	81 9/16"

† On low frame machines a minimum package height of 7" may be obtained by raising the conveyor above the machine rollers. Customer conveyor height should be no more than 10-5/8" above the machine rollers. Maximum package height is reduced by the amount the conveyor is raised.

* Adjustable from 21" to 29" in 1" increments on 18" & 24" chute height machines (Cut 3" off from inner leg for a 18" conveyor height).

** Conveyors heights of 7" to 17" are achieved as follows: No legs required at chute for 7" height; Cut 6" off from outer leg (P-042747) and cut off 2" from inner leg (P-042750) for a 9" height. Cut 6" off from outer leg and cut off 1" from inner leg for a 10" height. Cut 6" off from outer leg only for a 11" height. Cut 3" off from outer leg for 12", 13" and 14" heights. No leg alterations are needed for 15", 16" and 17" heights.

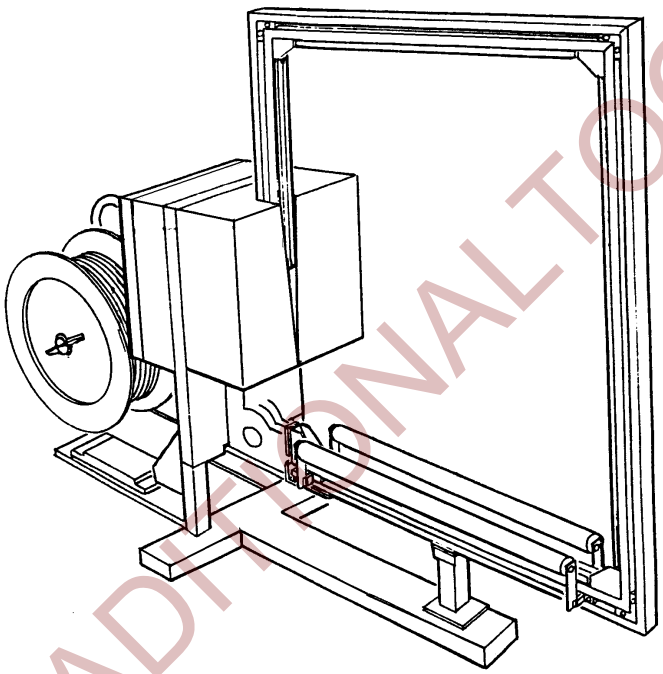
INSTALLATION AND MAJOR COMPONENTS

ELECTRICAL

Each MCD machine is driven by a 3/4 HP 208/230/460V, 50/60 Hz, three phase motor. Highest amp draw is 2.8 at 220V. All MCD machines are factory wired to operate on 230V. Motor leads must be changed during installation for operation at 460V.

⚠CAUTION

Installation and start-up must be performed by a Signode Service Engineer, assisted by plant personnel. Until the Engineer's arrival, the machine must remain in its shipping crate.



MCD POWER STRAPPING MACHINE
WITH DISPENSER AND MODULAR CHUTE SYSTEM

PRINCIPLES OF OPERATION

LOADING AND FEEDING STRAP

With the ON-OFF switch in the OFF position, insert strap between rollers into stretch-out box and then into entry chute until resistance is felt. Open left hand eccentric arm (167) (push eccentric arm in counter clockwise direction) and then push strap an inch or so further until once again resistance is felt. Release eccentric arm and turn machine on.

TENSIONING AND WELDING

With a bundle in the proper position, step on the footswitch, the machine will now run in the feed direction until the chute is filled. When the chute is full, the leading end of the strap hits a stop. Since the motor is still attempting to feed more strap into the chute, The excess strap folds up into the drop out arm chamber and causes the drop out arm (159) to swing open. This trips a limit switch signaling the motor to reverse. The same signal also actuates a solenoid operated gripper (103) which grips the free end of the strap.

The machine now tensions strap and, as soon as pre-set tension is reached, a mechanical clutch (47) shifts over to engage the welding cycle gear train. As soon as the welding cycle is completed, switch cam (215), located on the cam shaft, trips the limit switch to reverse the motor direction, shift clutch, and refill the strap chute approximately 3/4 full.

HOME POSITION

For home positioning, both face gate (126) and vibrator (134) must be fully closed. To bring machine into home position, turn off power and turn cam shaft with crank provided, in counterclockwise direction, until face gate and vibrator are closed. Note that turning effort drops sharply when this point is reached.

⚠WARNING

Remove and store crank. Failure to do so can result in severe personal injury.

TENSION ADJUSTMENT

Tension can be adjusted by turning the hand wheel (96) located on the machine frame. Full tension range is covered in approximately 1 1/2 turns of the adjustment wheel.

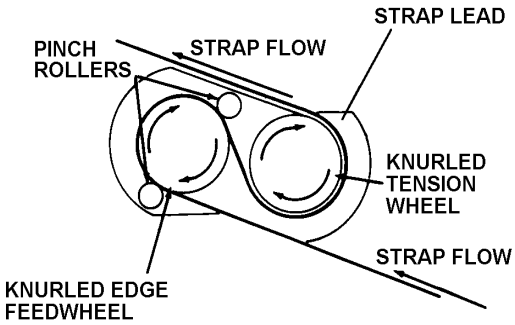
WELDING WITHOUT BUNDLE

If the machine is tripped without a bundle in place, the strap will be tensioned around the vibrator (134), welded, and sometimes broken. When this happens, the machine must be shut off and the strap pulled out. The ragged end of the strap must be cut off and the machine rethreaded.

PRINCIPLES OF OPERATION, Continued

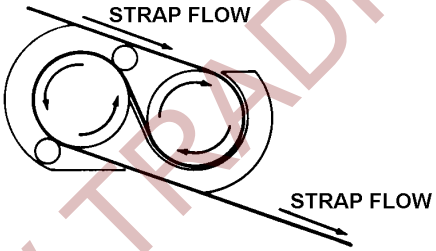
FEED CYCLE

Strap is fed by high speed knurled feed wheel and pinch rollers. During feed cycle, strap rides on strap lead and does not contact knurled tension wheel. Tension wheel at this time is rotating in opposite direction to strap.



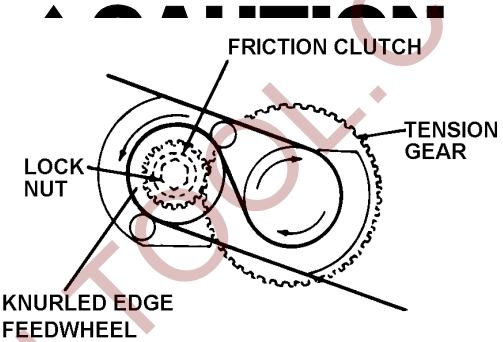
SLACK REMOVAL CYCLE

Slack is removed by high speed knurled feedwheel and pinch rollers. Knurled feedwheel is geared 3 times faster than knurled tension wheel. Tension wheel has an over running clutch so that it is free to rotate.

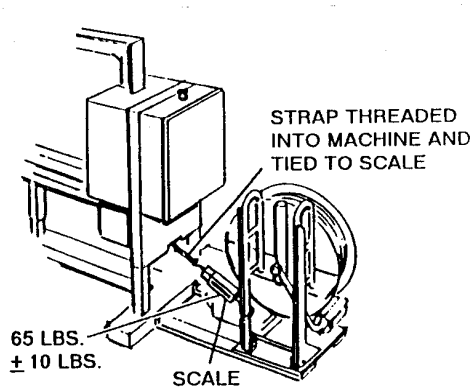


FINAL TENSION CYCLE

When the high speed knurled feedwheel stalls at the end of slack take-up, knurled tension wheel (geared down 3 times the power of the knurled feedwheel) takes over and pulls final tension. Knurled feedwheel at this phase slips at friction clutch.



The lock nut must be tightened only to the point where 65 lbs. ± 10 lbs. (289N ± 44N) tension is achieved before the knurled feedwheel slips at end of slack removal. If it is too tight, final tension will be over ridden resulting in poor, erratic tension.



MAINTENANCE AND LUBRICATION

⚠WARNING

Before complying with the following inspection procedure, make sure power has been disconnected.

8 HOUR INSPECTION

1. Clean machine thoroughly with air hose and check for obstructions, loose fasteners, etc.
2. Lubricate vibrator shaft (125). A slow down in vibrating sound during welding cycle is an indication of lack of lubrication. If this occurs, grease more frequently. Use Stailube #5225-01 multipurpose grease or equivalent.
3. Inspect tension and feed wheels (170 and 171) and pinch roller needle bearing (157).
4. Clean tension wheel (170).

40 HOUR INSPECTION

1. Cycle machine to open vibrator (134). Inspect and clean serrations. Check for freedom of movement.
2. Check release wedge (168), retainer plate (152), inner side plate (155), and outer side plate (164) for wear. Inspect strap entry guides (172 and 173) for burrs or obstructions. Check back up roller (156) to tension wheel (170) and feedwheel (171). Clearance not to exceed .011" (.28mm).
3. Clean all fittings.
4. Inspect drop out arm (159) for freedom of movement. Lubricate pivot lightly if necessary.
5. Adjust all belts and motor mounting brackets for proper belt tension.
6. Inspect chute system.
7. Check dispenser operation.
8. Check operation of gripper solenoid (178) and face gates (126 and 127).
9. Grease vibrator eccentric bearing (146) by adding Lubriplate into fork on vibrator (134). A slow down in vibrating sound during welding cycle is an indication of lack of lubrication. If this occurs grease more frequently. Use Stailube #5225-01 multipurpose grease or equivalent.
10. Grease toggle plate mechanism (120). Use grease fitting (201).
11. Grease cam lobes on vibrator cam.

200 HOUR INSPECTION

1. Check sealer housing for cutter (102) clearance, .003 maximum (.07mm), shim as necessary using (102A).
2. Check cam follower bearing (144) on toggle plate (120). Check plate grooves for burrs and galling.
3. Check slip clutch (57) setting. Should read 65lbs. (289N) ±10lbs. Adjust if necessary.
4. Check gear housing oil level and add oil as required. Fill gear housing with approximately 1 gallon (3.8 liters) of oil, using Shell Gear Oil EP #80, Texaco Meropa Lube #1, Mobil EP #80-90 or Gulf all Purpose Gear Oil #80.

LUBRICATION

Fill gear housing with approximately 1 gallon of either of the following oils: Shell Gear Oil EP #80, Texaco Meropa Lube #1, Mobile EP#80-90 or Gulf All Purpose Gear Oil #80.

NOTE: Due to lubricant incompatibility, lubricants being used in the machine should not be mixed together. Replace any lubricants with identical ones being used.

CLEANING NOTE: Where high pressure steam or water cleaning regulations are required, adequate coverage of the machine and strapping dispenser will be necessary, unless equipped for portability wherein the machine can be temporarily removed during the cleaning process.

ELECTRICAL SEQUENCE, MCD MACHINES W/O OPERATORLESS INTERLOCK

1. **GENERAL**
   Start by moving "E-Stop" to the "ON" position (pull out).

2. **FEED CYCLE**
   Momentarily depress F.S. (6) closing 3-16 to energize feed relay 1CR (6) through 1TR timed contact (6) 16-17 and 1TR instantaneous (6) 17-18.
   - **1CR (7) 3-17 closes to maintain 1CR (6) energized.**
   - **1CR (4) 3-4 closes to energize feed starter F(3) 6-7, through LS2 feed limit switch (3) 4-5, and T contact (3) 5-6.**

3. **TENSION CYCLE**
   2LS immediately:
   - **Opens (3) 4-5 to de-energize feed starter F (3) 6-7.**
   - **Closes (4) 4-12 to energize tension starter T (4) 13-7, and energize grip solenoid (5) 11-2 through 1TR (5) 12-11.**
   - **T closes (5) 14-12 to maintain itself through F (4) 12-13 and 1 CR (6) 3-14.**

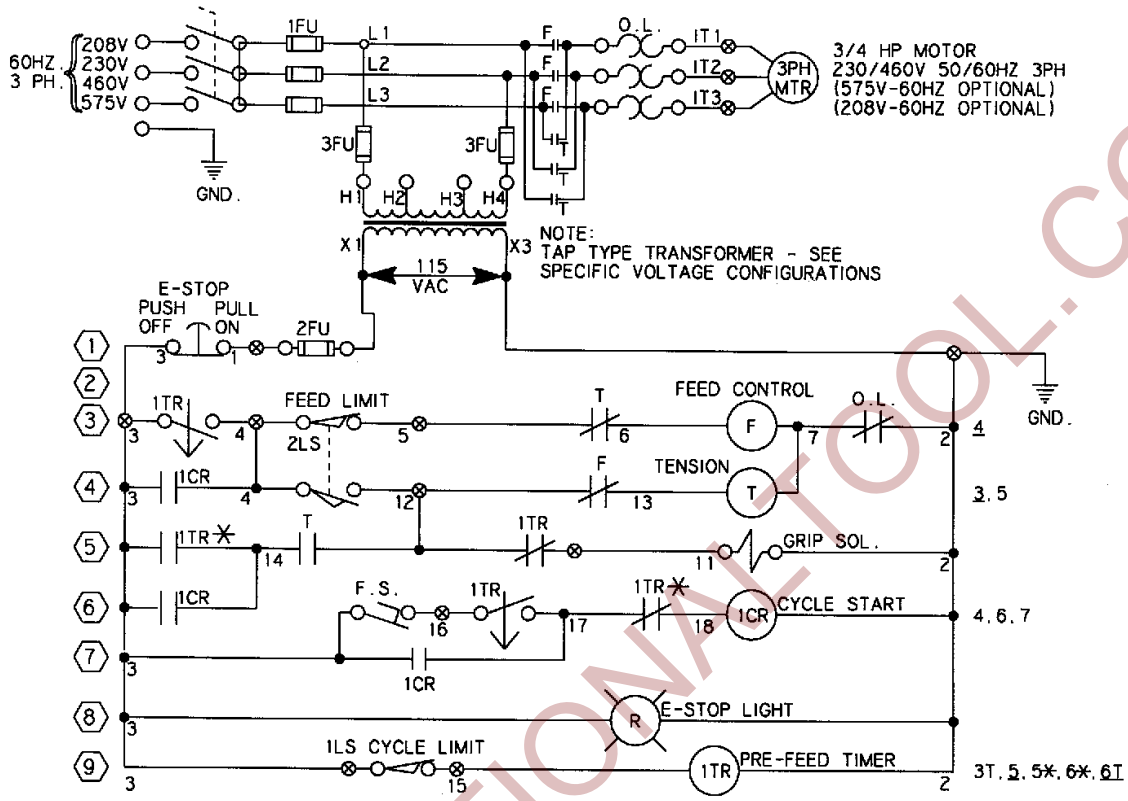
   Motor runs in a tension direction resetting 2LS, contacts (3) closing and (4) opening.

4. **WELD CYCLE**
   Motor continues to run in the tension direction to de-actuate 1LS (9), 3-15 which energizes 1TR (9).
   - **1TR (5) 12-11 opens to de-energize the grip solenoid (5) 11-2.**
   - **1TR (5) 3-14 closes to maintain T (4) through contacts F (4) 12-13, and T (5) 14-12.**
   - **1TR (6) 17-18 opens to de-energize 1CR (6).**
   - **1TR timed contact (3) 3-4 closes, anticipating pre-feeding at the end of the weld cycle.**
   - **1TR timed contact (6) 16-17 opens to prevent another cycle until after pre-feed has taken place.**

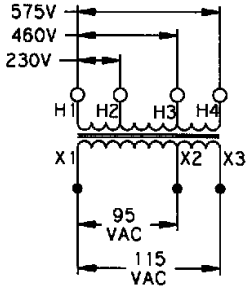
5. **PRE-FEED CYCLE**
   At the end of the weld cycle, 1LS (9) is actuated, de-energizing TR(9) 15-2.
   - **1TR (5) 3-14 opens to de-energize T (4).**
   - **1TR (6) 17-18 closes to allow 1CR (6) to get ready for another cycle.**
     1TR (3) 3-4 timed contact will open,
     de-energizing F (3), ending the pre-feed. 1TR should be set to feed strap 3/4 around chute.
   - **1TR (6) 16-17 timed contact will close, allowing 1CR (6) to be energized for another cycle, after pre-feed, through the actuation of the footswitch FS (6) 3-16.**

   Machine is ready for next strapping cycle.
   Motor runs in the feed direction until strap activates 2LS.

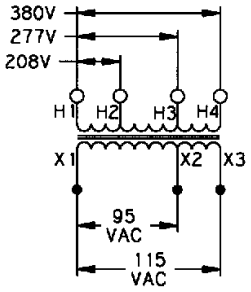
MCD ELECTRICAL SCHEMATIC 431899-2



TRANSFORMER TAP CONNECTIONS (STANDARD)



TRANSFORMER TAP CONNECTIONS (SPECIAL TRANS.)



NOTE:

✳ = N.O. CONTACT MUST OVERLAP N.C. CONTACT

⊗ = TERMINAL PT. IN PANEL

ELECTRICAL SEQUENCE, MCD MACHINES WITH OPERATORLESS INTERLOCK

1. **GENERAL**
   Start by moving "E-Stop" to the "ON" position (pull out).

2. **FEED CYCLE**
   Momentarily depress F.S. (6) to energize feed relay 1CR (6) through 1TR timed contact (6) 21-24 and 1TR instantaneous (6) 17-18.
   - 1CR (7) 19-17 closes to maintain 1CR (6) energized.
   - 1CR (4) 21-4 closes to energize feed starter F(3) 6-7, through LS2 feed limit switch (3) and T contact (3) 5-6.

3. **TENSION CYCLE**
   2LS immediately:
   - Opens (3) 4-5 to de-energize feed starter F (3) 6-7.
   - Closes (4) 4-12 to energize tension starter T (4) 13-7, and energize grip solenoid (5) 11-2 through 1TR (5) 12-11.
   - T closes (5) 14-12 to maintain itself through F (4) 12-13 and 1 CR (6) 3-14.

   Motor runs in a tension direction resetting 2LS, contacts (3) closing and (4) opening.

4. **WELD CYCLE**
   Motor continues to run in the tension direction to de-actuate 1LS (9), 3-15 which energizes 1TR (9).
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   - 1TR (6) 17-18 opens to de-energize 1CR (6).
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   - 1TR (6) 17-18 closes to allow 1CR (6) to get ready for another cycle.
   - 1TR (3) 3-4 timed contact will open,
     de-energizing F (3), ending the pre-feed. 1TR should be set to feed strap 3/4 around chute.
   - 1TR (6) 16-17 timed contact will close, allowing 1CR (6) to be energized for another cycle, after pre-feed, through the actuation of the footswitch FS (6) 3-16.

   Machine is ready for next strapping cycle.

6. **OPERATORLESS CONTACTS (OPTIONAL)**
   Contacts supplied by purchaser:
   - (1PC) N.C. contact on conveyor motor starter that opens whenever conveyor is running. This prevents the tension cycle from being started if conveyor is running.
   - (2PC) N.O. contact in conveyor package sensing circuit closes when conveyor has stopped and the package is in position and ready to receive strap. This signal must be held closed approximately one second then signal must be removed.

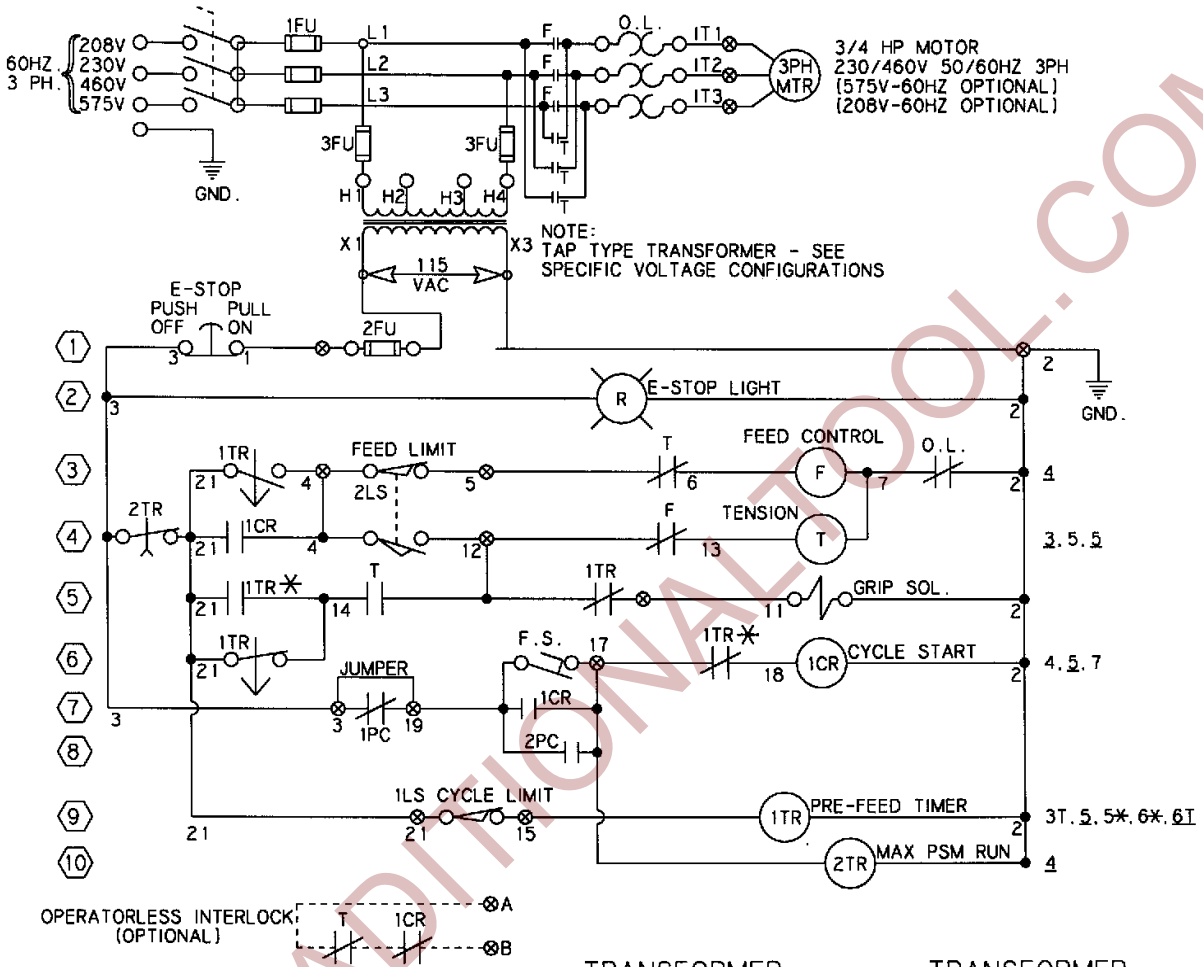
   Contacts supplied by Signode, circuit between terminals A and B:
   - (4-5, A&B) N.C. circuit from Signode machine to be wired into conveyor run circuit. This circuit will open when strapping cycle begins and close after strap has been applied.

NOTES: 2TR timer monitors the strapping cycle. If a malfunction occurs, 2TR times out, stopping the motor. E-Stop must be pushed OFF to reset the timer.

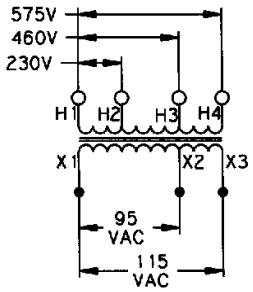
Approximate 2TR Timer Setting: Pre-feed timer setting plus final feed time plus take-up time for minimum package size plus 2 seconds.

MCD ELECTRICAL SCHEMATIC (OPERATORLESS INTERLOCK)

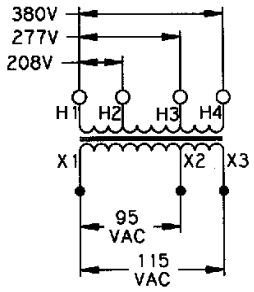
431899-2



TRANSFORMER TAP CONNECTIONS (STANDARD)



TRANSFORMER TAP CONNECTIONS (SPECIAL TRANS.)



NOTE:

* = N.O. CONTACT MUST OVERLAP N.C. CONTACT

⊗ = TERMINAL PT. IN PANEL

CONTROL PANEL ASSEMBLY

431675-2

KEY	QTY	PART	DESCRIPTION
1	1	293355	FUSED DISCONECT SWITCH
2	1	293356	DISCONNECT CONNECTING ROD
3	1	293340	OPERATING HANDLE
4	1	431690	E-STOP ILLUMINATED
5	1	431688	RELAY (1TR)
6	1	431689	OFF DELAY (1TR)
7	1	431679	REVERSING STARTER
8	1	431680	OVERLOAD RELAY
9			
10			
11			
12	1	431687	RELAY (1CR)
13			
14	1	431774	TRANSFORMER (208)
		431676	TRANSFORMER (230/460/575V)
15	1	431678	PRIMARY FUSE KIT
16	1	431677	SECONDARY FUSE KIT
17	1	431839	GROUND BAR
18	21	431684	TERMINAL BLOCK
19	2	436214	JUMPER (2 POS.)
20	4	434423	END CLAMP
21	1	431685	END PLATE
22	19"	292837	RAIL (7-1/8 , 10-1/2)
23	42	431837	MARKERS
24			
25			
26	1	436164	JUMPER (3 POS.)
27	1	436207	JUMPER (4 POS.)
28	1	292819	LEGEND PLATE
29	4"	431973	SPIRAL WRAP
33	2	431836	FUSE (3FU) 208/230/460V 4A
		431838	575V 2.5A
34	1	431682	FUSE (2FU) 3.2A
35	3	293010	FUSE (1FU) 208/230/460V 7.5A
		431699	575V 6.0A
36	1	431686	RELAY SOCKET (1CR, 2TR)
37	REF	431681	TIME DELAY RELAY (2TR)
38	REF	431683	AUXILIARY CONTACT
39	REF	431841	LAMP
40			
41	48"	431897	WIRING DUCT
42	1	436104	SIGN
43	1	286207	(WARNING) SIGN - ELECTRICAL
44	1	420385	LATCH
45	70"	431898	GASKET
46	2	431849	HOLE PLUG
47	2	431848	CORD GRIP
48	2	431847	CORD GRIP
49	4	431972	SEALING RING
50	4	014797	LOCKNUT
51	1	431694	CABLE (3 POLE) SOLENOID
52	2	431692	CABLE (5 POLE) 1LS, 2LS
53	1	431691	CABLE (4 POLE) MOTOR
54	1	431693	RECEPTACLE (3 POLE)
55	1	431758	ENCLOSURE
56	1	431759	PANEL

NOTES:

[1] CONTROL PANEL ASSEMBLY WIRED PER SCHEMATIC 431899

[2] KEYS 36, 37 AND 38 ARE PART OF OPERATORLESS INTERLOCK. ADDITIONAL QTY. REQUIRED. SEE BOM 431971

[3] LAMP (KEY 39) SUPPLIED AS PART OF E-STOP (KEY4)

CONTROL PANEL ASSEMBLY

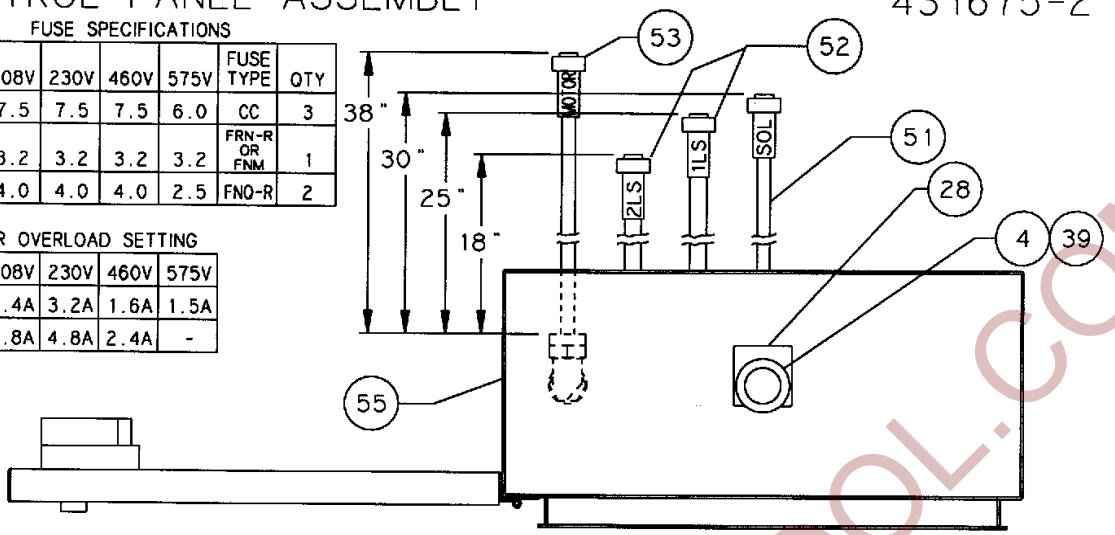
431675-2

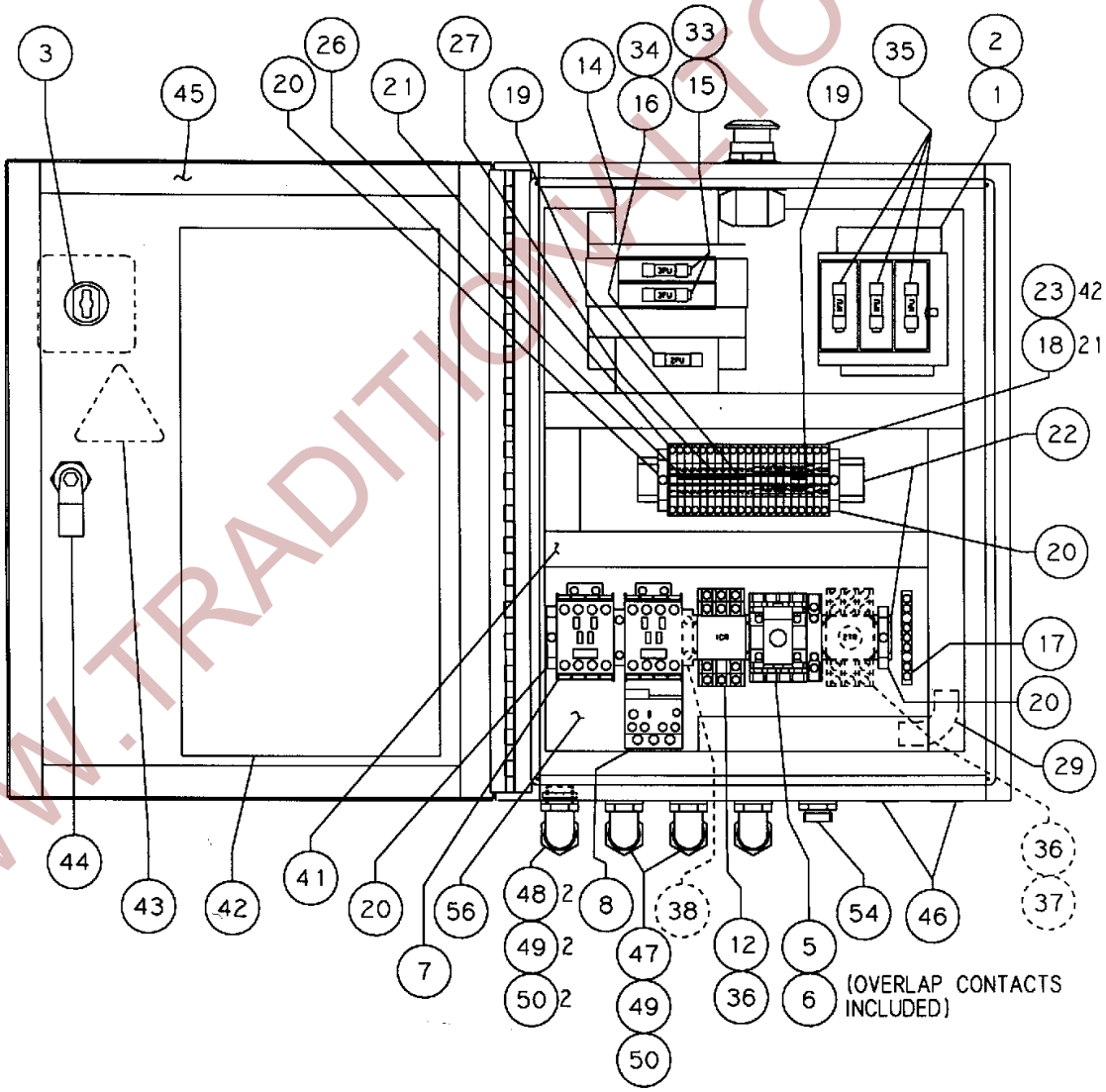
FUSE SPECIFICATIONS

	208V	230V	460V	575V	FUSE TYPE	QTY
1FU	7.5	7.5	7.5	6.0	CC	3
2FU	3.2	3.2	3.2	3.2	FRN-R OR FNM	1
3FU	4.0	4.0	4.0	2.5	FNQ-R	2

MOTOR OVERLOAD SETTING

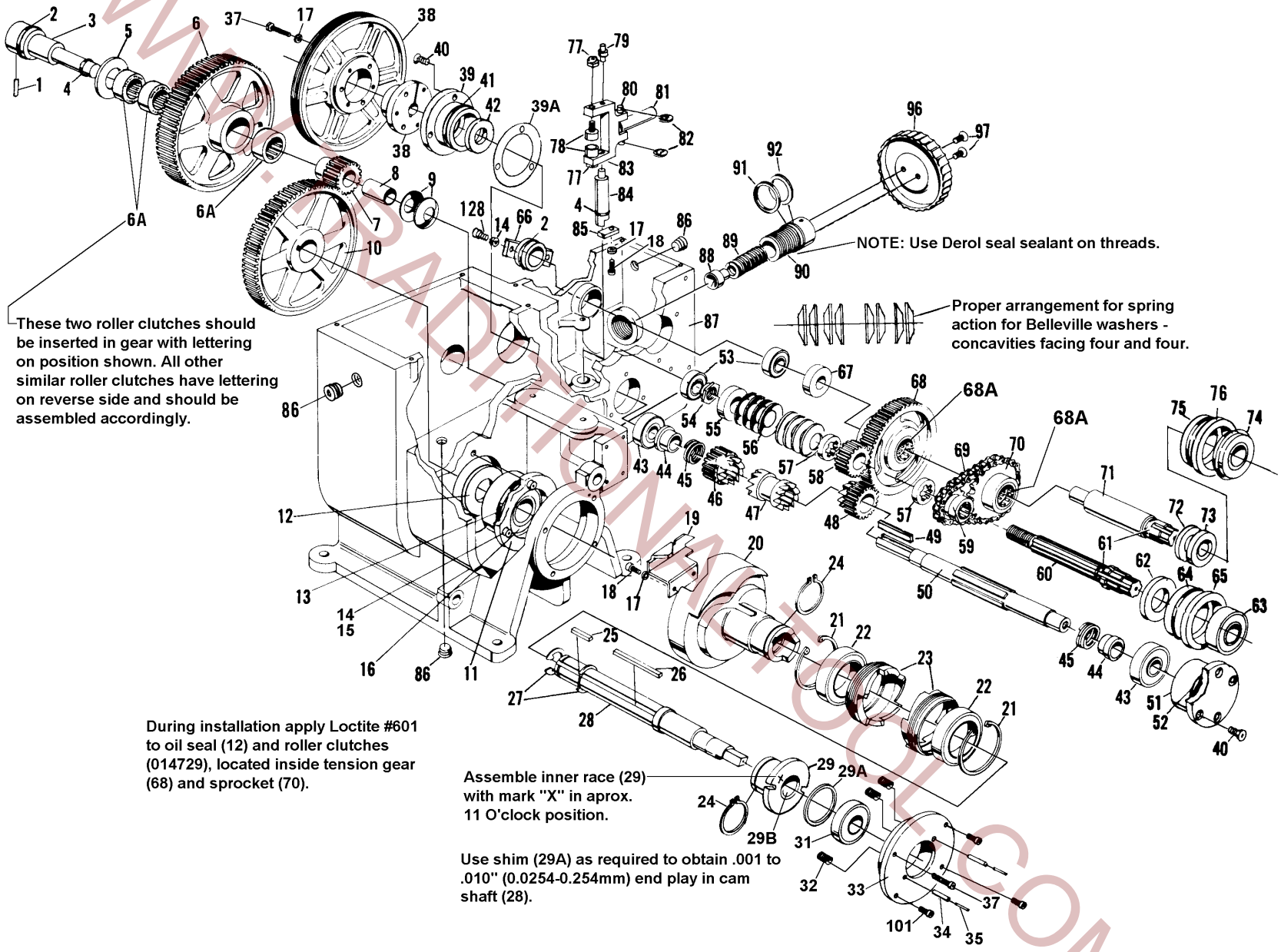
MOTOR	208V	230V	460V	575V
GE	3.4A	3.2A	1.6A	1.5A
RELIANCE	4.8A	4.8A	2.4A	-





PARTS LIST

KEY	QTY	PART #	DESCRIPTION
1	1	016120	Roll pin, 1/4 x 2-1/4
2	2	008597	O-ring, SAE 214
3	1	014620	Idler shaft
4	2	008596	O-ring, SAE 111
5	1	014739	Thrust bearing
6	1	014621	Idler gear
6A	3	014685	Roller clutch
7	1	014622	Idler pinion
8	1	014704	Sleeve bearing
9	2	014714	Belleville washer
10	1	014601	Vibrator gear
11	1	053043	Cam shaft cover
12	1	053054	Oil seal, C/R #10153
13	1	091863	O-ring, SAE 227
14	25	004238	Lockwasher, #10
15	4	004618	SHCS, #10-24 x 5/8
16	1	014679	Bearing, N/D Z99R16
17	14	002187	Lockwasher, 1/4
18	13	009041	SHCS, 1/4-20 x 3/4
19	1	053453	Kick tab
20	1	053454	Vibrator cam
21	2	014678	Truarc, #N5000-268
22	2	014681	Bearing
23	2	014623	Vibrator clutch
24	2	014677	Truarc, #5100-156
25	1	014720	Key
26	1	008378	Key
27	2	014676	Truarc, #5133-98
28	1	053040	Cam shaft
29	1	014609	Inner race assembly, for MCD-310 only
	1	042776	Inner race assembly, for MCD-710 only
	1	009884	Inner race assembly, for MCD-510 only. (Tenax strap only.) Requires Std Vibrator
29A	1	014705	Sleeve bearing
31	2	014682	Bearing
32	3	014813	Spring
33	1	014608	Cam shaft cover
33A	A/R	006697	Shims
34	2	014810	Roll pin, 1/4 x 1 1/4
35	2	043855	Roll pin, 5/32 x 1 1/4
36	28	009041	SHCS, 1/4-20 x 3/4
37	4	007146	SHCS, 1/4-20 x 1 1/4
38	1	014724	Sheave assembly
39	1	280720	Back clutch cover
39A	4	280721	Back cover shim
40	8	009050	SHFS, #10-24 x 5/8
41	1	053052	O-ring, SAE 135
42	1	053055	Oil seal
43	2	053059	Bearing
44	2	053042	Seal pinion stop
45	2	014807	Pinion stop spring
46	1	014642	Right clutch pinion
47	1	014624	Tensioner Clutch
48	1	014672	Left clutch pinion
49	1	071636	Key
50	1	053039	Clutch shaft
51	1	053045	Front clutch cover
52	1	008546	O-ring, SAE 225
53	2	014728	Bearing, N/D Z99502
54	1	014811	Flexloc nut
55	1	014655	Spring spacer
56	8	014730	Belleville washer
57	2	014641	Clutch disc
58	1	014658	Slip clutch pinion
59	1	014657	Chain sprocket
60	1	015310	Feed shaft
61	2	008584	O-ring, SAE 113
62	1	053057	Oil seal, C/R #12384
63	1	014727	Bearing, N/D Z99604
64	1	053053	O-ring, SAE 139
65	1	053048	Feedwheel cover
66	1	053046	Tension shaft plug
67	1	014660	Tension shaft plug
68	1	014659	Tension gear
68A	2	014729	Roller clutch
69	1	014808	Chain
70	1	014666	Sprocket assembly
71	1	014663	Tension shaft
72	1	053041	Sprocket spacer
73	1	053056	Oil seal
74	1	053060	Bearing, N/D Z499604
75	1	007027	O-ring, SAE 141
76	1	053047	Tension shaft cover
77	2	072108	Flexloc nut
78	2	014722	Bearing
79	1	014639	Fork pin
80	1	014638	Knuckle pin
81	1	014633	Knuckle
82	2	053063	E-ring, X5133-31
83	1	014637	Fork
84	1	014643	Fork pivot pin
85	2	014652	Vibrator shaft keeper
86	3	008922	Pipe plug
87	1	053450	Gear housing
88	1	014634	Pusher
89	1	009719	Spring (Std. Tension)
	1	014881	Spring (Low Tension)
90	1	014640	Tension regulator
91	4	014726	Tension stop ring
92	1	014721	Quad ring SAE 222
96	1	008361	Hand wheel
97	2	008853	FHSCS, 5/16-18 x 5/8
179	6	009397	SHCS, #10-24 x 1/2



PARTS LIST, CONTINUED

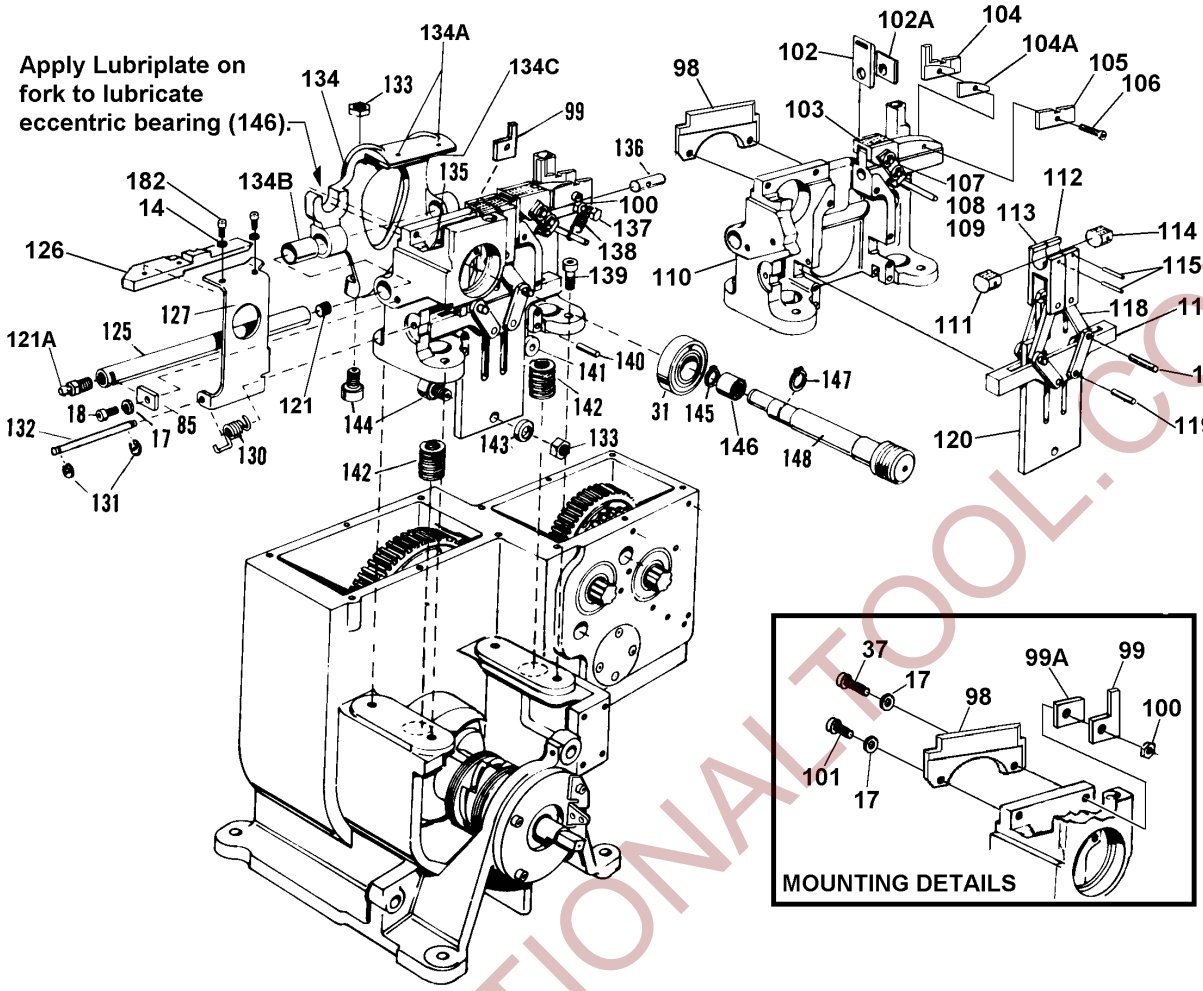
WELDING ASSEMBLY

KEY	QTY	PART #	DESCRIPTION
14	2	004238	Lockwasher, #10
98	1	280724	Edge guide, Std.
	1	014451	Edge guide, Short
99	1	280723	Strap guide
99A	1	280722	Side guide spacer
100	6	005319	Hex locknut, 1/4
101	4	009042	SHCS, 1/4-20 x 1
102	1	077871	Cutter
102A	A/R	043512	Shim
103	1	016614	Gripper, Std.
	1	014455	Gripper, Short
104	1	432501	Right side guide
104A	1	432502	Side guide spacer
105	1	432508	Left side guide
106	3	004174	SHCS, #10-24 x 7/8
107	4	023766	Truarc, #5133-25
108	2	016631	Gripper pin
109	1	016619	Grip yoke ass'y, Std.
	1	014456	Grip yoke ass'y, Short
110	1	016630	Sealer housing, Std.
	1	014471	Sealer housing, Short
111	1	042777	Grip segment, Std.
	1	014453	Grip segment, Short
112	1	077874	Right grip carriage
113	1	016620	Left grip carriage, Std.
	1	053455	Left grip carriage, Short
114	1	077872	Right grip segment
115	2	014809	Roll pin, 3/32 x 1
116	1	014610	Anchor plate
117	2	015304	Wedge pin
118	8	014616	Link
119	4	014617	Link pin
120	1	014618	Toggle plate
121	1	070445	Grease fitting
121A	1	007568	Pipe plug, 1/8"
125	1	014653	Vibrator shaft
126	1	260418	Face gate, Std.
	1	260419	Face gate, Short
127	1	014647	Face gate support, Std.
	1	014463	Face gate support, Short
130	1	014816	Gate spring
131	2	014782	Truarc, #5133-18
132	1	016635	Gate pivot pin
133	2	015145	Flexloc nut, 3/8-16
134	1	014740	Vibrator ass'y, Std.
	1	014883	Vibrator ass'y, Short
134A	2	004549	Roll pin
134B	1	014776	Bushing

KEY	QTY	PART #	DESCRIPTION
134C	1	014644	Vibrator insert, Std.
	1	014452	Vibrator insert, Short
135	1	014680	Bearing, N/D Z499503
136	1	016633	Release pin, Std.
	1	014882	Release pin, Short
137	1	013630	HHCS, 1/4-20 x 1 1/4
138	1	014804	Spring
	1	163356	Spring, for use with Tenax strap only.
139	4	013626	SHCS, 5/16-18 x 1 1/4
140	2	014781	Needle roller
141	2	014668	Guide roller
142	2	014812	Spring, standard vibrator
	2	160574	Spring, Std., for use with Tenax strap only. Requires a Std. Vibrator.
	2	014940	Spring, short vibrator
143	1	014667	Cam roller spacer
144	2	014686	Bearing, McGill #CF-3/4-SB
145	1	013533	Truarc, #5100-66
146	1	014683	Bearing, INAC #NK 12/16
147	1	008598	Truarc, #5100-66
148	1	016636	Vibrator eccentric
182	2	023099	BHCS, #10-24 x 3/8

⚠WARNING

Inspect all parts daily and replace them if they are worn or broken. Failure to do this can affect a product's operation and could result in serious personal injury.



PART REMOVAL & REPLACEMENT - VIBRATOR (134), SOLENOID GRIPPER (103), AND GRIPPER SEGMENTS (111 AND 114).

1. **Remove right cover (275) and grease fitting from vibrator shaft (125).**
2. **Remove vibrator shaft keeper (85).**
3. **Remove eccentric bearing (146).**
4. **Slide shaft out as far as possible. Vibrator is now free and can be lifted out. Gripper segments are accessible after removing vibrator and can be removed after driving out two roll pins (115). Solenoid gripper is also exposed and can be easily removed.**

PART REMOVAL & REPLACEMENT - CUTTER (102)

1. **Turn cam shaft until vibrator opens.**
2. **Remove two socket head cap screws (128).**
3. **Remove solenoid bracket (181). Do not disturb release wedge (168) or wedge pins (117).**
4. **Remove two button head socket screws (182) and solenoid cover (180).**
5. **With a magnet, remove two link pins (119) from grip carriages (112 and 113). Grip carriages can now be removed, giving access to cutter.**
6. **Replace cutter. Shim (102A) as required to obtain .003" clearance.**
7. **Reassemble, making sure rear links (118) are engaged when replacing link pins.**

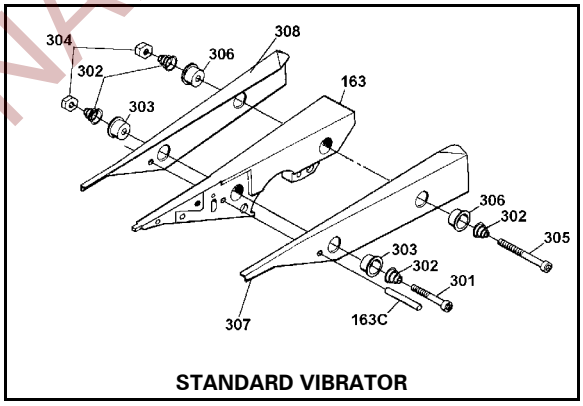
PART REMOVAL & REPLACEMENT - MICRO-SWITCH ADJUSTMENT

1. **DROP-OUT ARM SWITCH (2LS) - Switch roller must ride against drop-out arm (159) when drop-out arm is fully closed. Switch must trip before drop-out arm is fully open.**
2. **CAM SHAFT SWITCH (1LS) - Switch must be set to trip as soon as machine is in home position.**

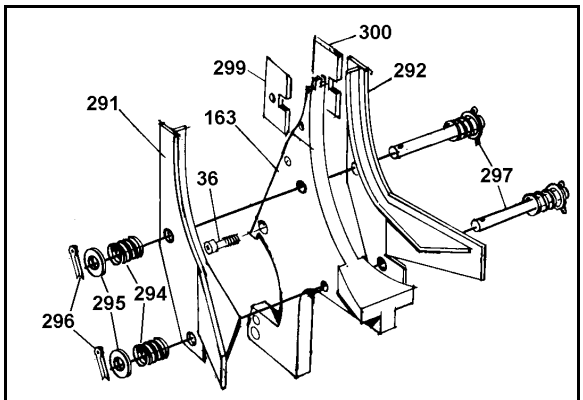
PARTS LIST, CONTINUED

STRAP TRANSPORT MECHANISM

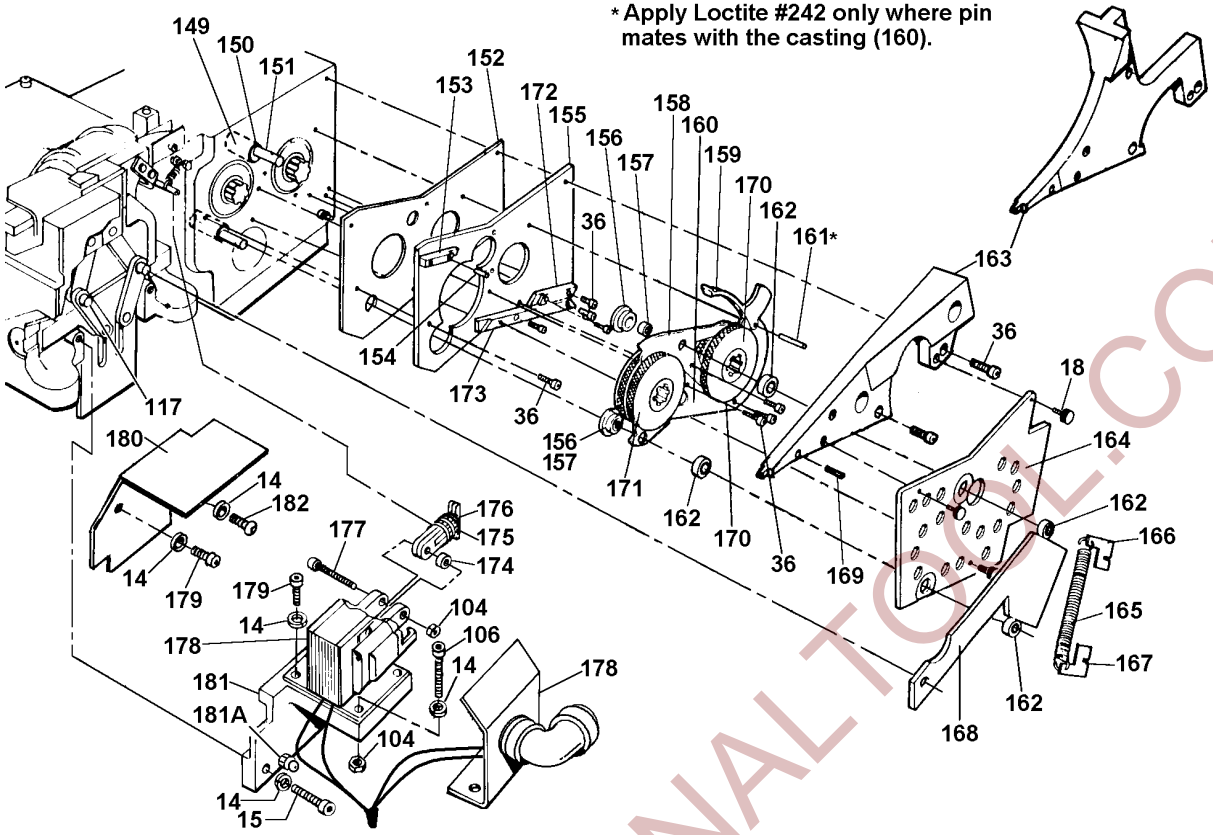
KEY	QTY	PART #	DESCRIPTION
36	1	009041	SHCS, 1/4-20 x 3/4
149	2	053058	Oil seal, Victor #K3-63158
150	2	014837	Bearing, Torrington BH-812
151	2	016632	Roller eccentric
152	1	053050	Retainer plate
153	1	016608	Lower strap guide
154	1	005768	Roll pin, 3/16 x 1/2
155	1	053051	Inner side plate
156	2	015306	Backup roller
157	2	015315	Needle bearing, Torrington B-65
158	1	016602	LH strap lead ass'y
159	1	016610	Drop out arm
160	1	016601	RH strap lead ass'y
161	1	014522	Dowel
162	4	047262	Ball bearing, Fafnir #S3NPP8
163A	1	432507	Upper strap guide, Standard vibrator
163B	1	042775	Upper strap guide, Short vibrator
163C	1	005616	Roll pin
164	1	015317	Outer side plate
165	1	009171	Spring
166	1	074687	Eccentric arm, RH
167	1	074688	Eccentric arm, LH
168	1	015301	Release wedge
169	1	008837	Roll pin, 1/8 x 9/16
170	1	042145	Tension wheel
171	1	165199	Feedwheel
172	1	016607	Short entry guide
173	1	016609	Long entry guide
174	1	023027	Spacer
175	2	016618	Solenoid link
176	1	015313	Spring
177	7	074612	SHCS, #10-24 x 1 1/2
178	1	431816	Solenoid assy
179	3	009397	SHCS, #10-24 x 1/2
180	1	014693	Solenoid cover
181	1	015302	Solenoid bracket
181A	1	071646	Grease fitting
182	4	023099	BHCS, #10-24 x 3/8
291	1	056006	Gate, LH
292	1	056007	Gate, RH
294	4	002164	Cotter pin, 1/16 X 1/2
295	4	009392	Washer
296	4	009271	Gate spring
297	2	014897	Chute pin
299	1	070059	Side guide, LH (short)
300	1	070063	Side giude, RH (short)
301	1	008738	SHCS, 10-24 x 1 1/4
302	4	072432	Gate spring
303	2	072400	Spring retainer
304	2	013856	Flexlock nut, 10-24
305	1	015321	SHCS, 10-24 x 1 3/4
306	2	040460	Spring retainer
307	1	254952	Left gate
308	1	254953	Right gate



STANDARD VIBRATOR



SHORT VIBRATOR



⚠WARNING

Inspect all parts daily and replace them if they are worn or broken. Failure to do this can affect a product's operation and could result in serious personal injury.

PART REMOVAL & REPLACEMENT - TRACTION WHEELS (170, 171)

1. Remove pinch roller spring assembly and ball bearings (162, 165, 166 and 167).
2. Remove outer side plate, (164), by removing three Allen head screws. Release wedge, (168) will pivot upward to allow access to the feed system.
3. Loosen two socket head cap screws (36) from right strap lead (160).
4. Pull off feedwheel.
5. Reassemble wheel and strap lead. Shift right strap lead while screws are still loose to obtain maximum uniform gap for strap passage.
6. Loosen two socket head cap screws (36) from left strap lead (158).
7. Pull off two pinch roller bearings (162).
8. Pull off tension wheel.
9. Replace wheel and reassemble, again making sure that the lead is positioned for maximum uniform strap gap.

PARTS LIST, CONTINUED

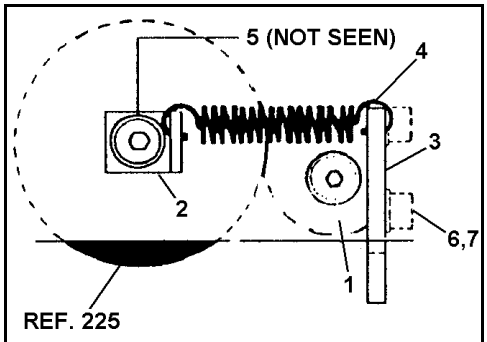
EXTERNAL ASSEMBLY

KEY	QTY.	PART NO.	DESCRIPTION
184	2	014698	Gear cover
185	2	053049	Gasket gear cover
186	1	053061	Poly-V-Belt, 6 groove, "J" section, 24.0" P.L.
187	1	014793	Motor plate
188	2	071836	Hex jam nut, 5/16-18
189	2	028976	Square HSS, 5/16-18 x 1 3/4
190	1	014725	Poly-V-Belt, 6 groove, "J" section, 49.0" P.L.
191	3	001250	Flat washer, 5/16
192	7	002188	Lockwasher, 5/16
193	7	006366	HHCS, 5/16-18 x 3/4
194	1	431992	MCD Motor Assy, 208/230/460V, 3 phase, 50/60 Hz.,
	1	059316	MCD Motor, 575V, 60Hz (Optional)
195	21	009189	Locknut, 3/8-16
196	2	007453	Flat washer, 3/8
197	2	014794	Pivot arm
198	2	008845	SHCS, 5/16-18 x 7/8
199	1	014779	Motor bracket
200	1	014796	HHCS, 3/8-16 x 5
201	1	014945	Frame, short
	1	014935	Frame, standard
202	2	014723	Motor sheave, 60 Hz
	2	056072	Motor sheave, 50 Hz
203	2	014788	Idler wheel
204	2	010019	Roll pin, 1/4 x 1 1/8
205	2	014791	Truarc, #5100-50
206	2	020142	Bearing, Fafnir S5PP
207	1	053062	Poly-V-Belt, 6 groove, "J" section, 26.0" P.L.
208	2	014790	Idler link
209	2	014795	Idler spring
210	2	006787	Roll pin, 3/16 x 1
211	2	014792	Idler pivot
212	4	009069	Hex nut, 3/8-16
213	4	006243	Lockwasher, 3/8
214	2	008738	SHCS, #10-24 x 1 1/4
215	1	014737	Switch cam
216	2	009092	HHCS, 3/8-16 x 1 1/2
217	4	014462	Spacer, Short only
218	1	431865	1LS Switch assy
219	1	014886	Wrench assy, packaged loose
220	2	014896	HHCS, 3/8-16 x 4
225	1	014936	Rear roller
226	1	014937	Front roller

KEY	QTY.	PART NO	DESCRIPTION
227	2	023708	Socket head shoulder screw, 3/8 x 1
228	2	072132	Locknut (thin) 5/16-18
233	1	075615	Washer
234	1	016363	Groove pin
235	1	016361	Spring
237	1	071943	Jiffy clamp
256	1	431695	Foot switch
257	1	431993	2LS Switch assy
258	1	431999	Spring Kit for 2LS

OPTIONAL STRAP SNUBBER FOR USE WITH TENAX STRAP ONLY. Kit No. 185298

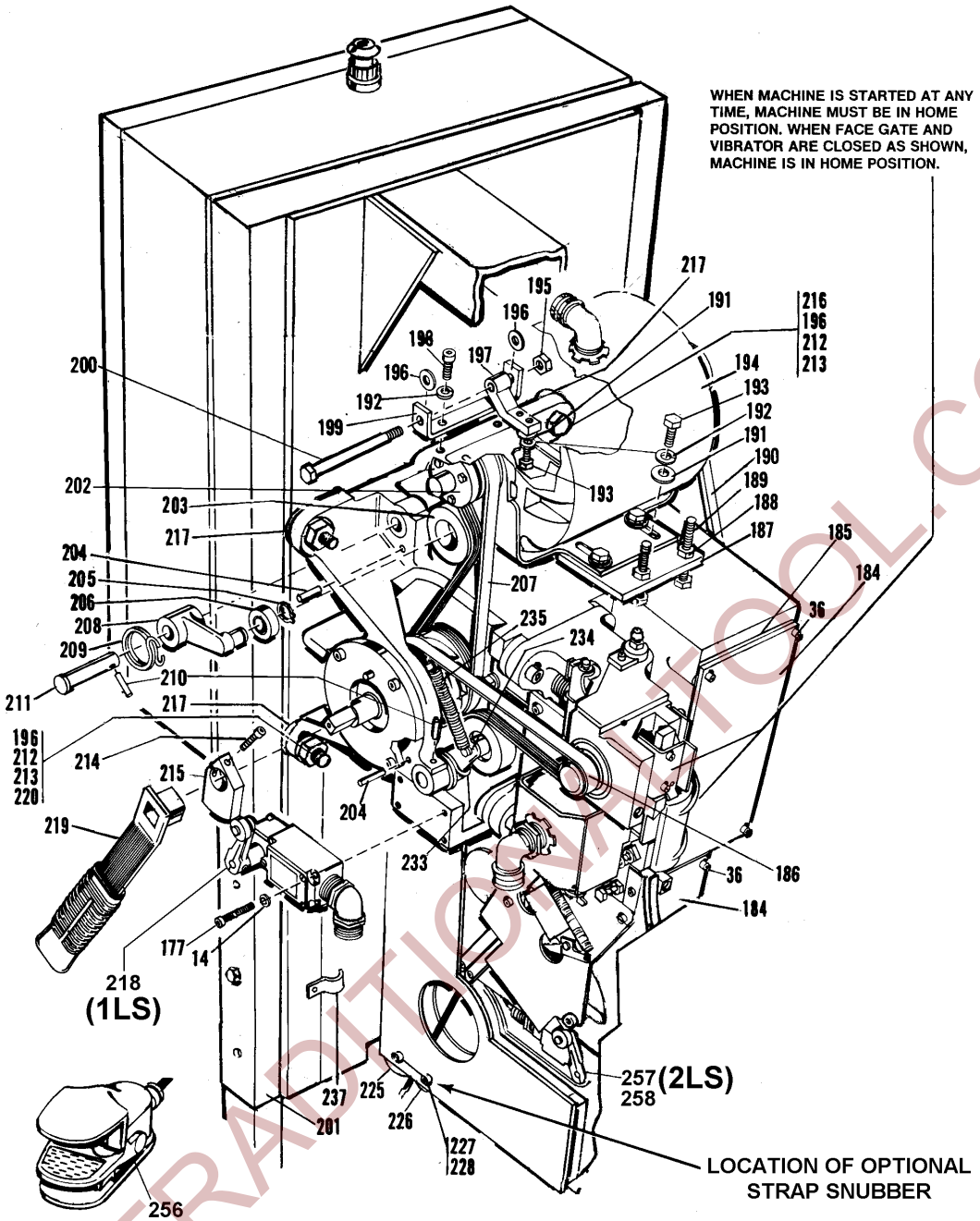
KEY	QTY.	PART NO	DESCRIPTION
1	1	185311	Snubber
2	1	185312	Spring tab
3	1	185313	Lock lever
4	1	014804	Spring, Lee #LE-031D-2-MW
5	1	013862	Oilite bushing
6	1	009397	SHCS, #10-24
7	2	004238	Lock washer, #10



OPTIONAL STRAP SNUBBER

⚠WARNING

Inspect all parts daily and replace them if they are worn or broken. Failure to do this can affect a product's operation and could result in serious personal injury.



PART REMOVAL & REPLACEMENT - DRIVE BELT

NOTE: If replacing belts on an MCD head in the machine, the slot marked X will be in the 2 o'clock position.

1. **Remove left cover (276).**
2. **Remove arm (218) from the 1LS micro-switch.**
3. **Remove switch cam (215) from the cam shaft end.**
4. **Remove four socket head cap screws (37) from cam shaft cover (33).**
5. **Thread two socket head cap screws into the tapped holes of the shaft cover and tighten uniformly until cover comes off. If ball bearing (31) does not come off with cover, use a bearing puller.**
6. **Slip belt (186) off clutch. Pull off outer half of vibrator clutch assembly (23,29) from the cam shaft. Shaft must be centered for clutch to clear opening. Remove old belt.**
7. **Reassemble, making sure that cover roll pins (34) engage slots in inner race (29). Slot marked X must be in 11 o'clock position if performing this procedure with the head removed from the machine and in the service position as shown.**
8. **Set micro-switch (1LS) for proper operation - refer to following page.**

MICRO SWITCH ADJUSTMENT

General Notes about micro switches:

2LS: DROP-OUT ARM SWITCH

Switch roller must ride against drop-out arm when drop-out arm is fully closed. Switch must trip before drop-out arm is fully open and reset before being fully closed.

1LS: CAM SHAFT SWITCH

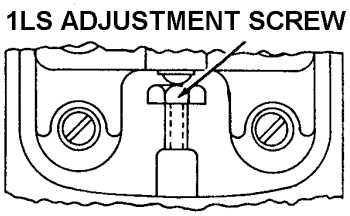
Switch arm must be positioned on its shaft so that the machine's cam shaft is in home position at the end of cycle.

1LS: INTERNAL SWITCH ADJUSTMENT

With switch mounted on the machine, switch arm must travel 18° to 22° from rest position to trip (1LS should trip in the upward direction only). To check, turn off power and use a wrench to advance the cam shaft until the arm of 1LS is free. The diagram below may be used to check this adjustment.

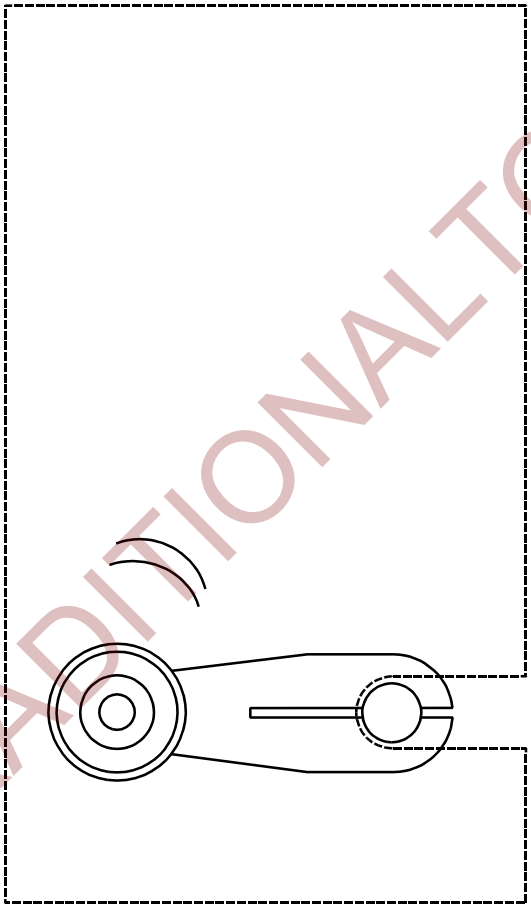
1LS ADJUSTMENT PROCEDURES

1. **Trace or photocopy the 1LS diagram shown on the following page. Cut out the reproduction along the dotted line.**
2. **Slip the diagram behind the machine's limit switch arm so that the actual arm exactly covers the arm in the diagram.**
3. **Secure the diagram in place to the cable fitting using a piece of tape. This will allow the cover to be removed if necessary without having to remove the diagram.**
4. **Raise the arm to determine if a click occurs when the rollers edge is between the two arcs shown on the diagram. (The two arcs correspond the roller travel of 18° to 22°).**
5. **If the click occurs too early or late, remove the limit switch cover.**
6. **If the click occurs too early, turn the adjustment screw clockwise and re-check the travel. If it occurs too late, turn the adjustment screw counter-clockwise and recheck.**
7. **Replace the cover after the limit switch has been properly adjusted.**



1LS ADJUSTMENT DIAGRAM

Photocopy or trace the diagram below.



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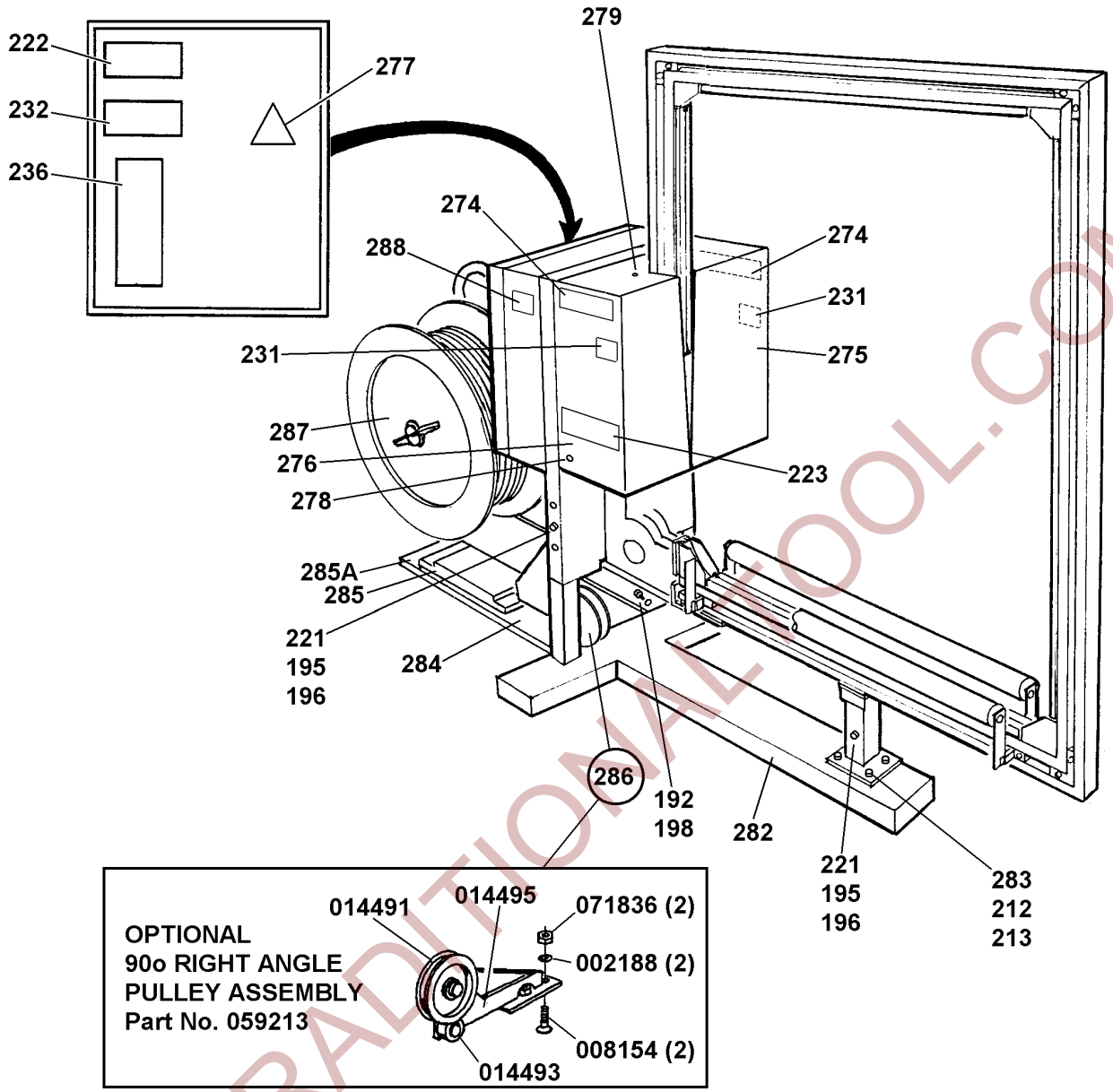
COVERS, SIGNS AND DISPENSER BRACKETS

KEY	QTY	PART #	DESCRIPTION
221	3	014980	HHCS, 3/8-16 x 3
222	1	168607	Electrical name plate
223	1	185803	Warning sign
231	2	177816	Warning sign
232	1	055962	Instruction plate
236	1	286206	Warning sign
273	3	076482	Drive screw, #2 x 5/16
274	2	071129	Logo
275	1	014960	Right cover, Std.
	1	056076	Right cover, Short
276	1	014950	Left cover
277	1	286207	Safety sign
278	2	185803	BHCS, 5/16-18 x 5/8
279	4	016638	FHSS, 5/16-18 x 5/8
282	1	014905	Base assembly
283	2	002844	HHCS, 3/8-16 x 1 1/4
284	2	014999	Dispenser bracket assembly
285A	4	014828	Roll pin, 7/16 x 1
286	1	014490	Pulley arm assembly
	1	059213	Pulley arm assembly, 90° right angle
288	1	081618	Nameplate (MCD-710)
	1	176963	Nameplate (MCD-510)

⚠WARNING

Inspect all parts daily and replace them if they are worn or broken. Failure to do this can affect a product's operation and could result in serious personal injury.



RECOMMENDED SPARE PARTS LIST, HEAD

KEY	QTY	PART #	DESCRIPTION
2	2	008597	O-ring, SAE 214
4	2	008596	O-ring, SAE 111
6A	3	014685	Roller clutch
12	1	053054	Oil seal, C/R #10153
13	1	091863	O-ring, SAE 227
23	2	014623	Vibrator clutch
33A	A/R	006697	Shims
41	1	053052	O-ring, SAE 135
42	1	053055	Oil seal, Victor #K3-63529
52	1	008546	O-ring, SAE 225
56	8	014730	Belleville washer
57	2	014641	Clutch disc
61	2	008584	O-ring, SAE 113
62	1	053057	Oil seal, C/R #12384
64	1	053053	O-ring, SAE 139
68A	2	014729	Roller clutch
73	1	053056	Oil seal, Victor #K3-64560
75	1	007027	O-ring, SAE 141
102	1	077871	Cutter
102A	4	043512	Shim
103	A/R	016614	Gripper, Standard Vibrator (As required per machine configuration.)
	A/R	014455	Gripper, Short Vibrator (As required per machine configuration.)
107	2	023766	Truarc retaining ring, #5133-25
114	1	077872	Right gripper segment
130	2	014816	Gate spring
134C	2	014776	Bushing
144	1	014686	Bearing
145	1	013533	Truarc retaining ring, #5100-46
146	1	014683	Bearing, INAC #NK 12/16
149	2	053058	Oil seal, Victor #K3-63158
151	2	016632	Roller eccentric
156	2	015306	Back-up roller
157	2	015315	Needle bearing, Torrington B65
158	1	016602	Left strap lead assembly
160	1	016601	Right strap lead assembly
162	4	047262	Ball bearing, Fafnir #S3PP
165	1	009171	Spring
168	1	015301	Release wedge
170	1	042145	Tension wheel
171	1	165199	Feedwheel
185	2	053049	Gear case gasket
186	1	053061	Poly-V-Belt, 6 groove, "J" section, 24.0" P.L.
190	1	014725	Poly-V-Belt, 6 groove, "J" section, 49.0" P.L.
207	1	053062	Poly-V-Belt, 6 groove, "J" section, 26.0" P.L.

- When ordering parts, please show model and serial number, part number, and name.
- Standard hardware can be obtained from your local hardware supplier.

TROUBLESHOOTING, MACHINE/HEAD

The following items are the most common machine symptoms if problems occur. For symptoms or remedies not shown, contact your Signode service representative for additional information and details. The following machine symptoms are shown in this manual:

#1 Operator actuates foot switch and machine unthreads completely.
#2 Strap escapes chute and continues to feed until the machine is shut off.
#3 Hesitation during welding.
#4 Machine fails to stop in proper home position.
#5 Motor fails to start.
#6 Machine continues running in feed direction, but fails to fill chute.
#7 Machine pulls tension but fails to go into welding cycle or hesitates before going into weld.
#8 Machine continues to run in weld direction.
#9 Double welding. Immediately after completing cycle machine goes into another weld cycle.
#10 Strap escapes from stretch-out box during take-up.
#11 Low or erratic tension.

#1 SYMPTOM: No weld. Operator actuates foot switch but instead of tensioning and welding, machine unthreads completely.

CAUSE	REMEDY
1. Machine not in home position.	1. Check home position and reposition if needed.
2. Obstruction in strap path.	2. Inspect and clean chute, index machine, and inspect grippers for loose particles. Indexing required to expose grippers.
3. Gripper segments (111 and 114) not lined up.	3. Gripper segments stuck and cannot align themselves. Remove, clean, and lubricate. Replace if damaged.
4. Strap end split or damaged.	4. Cut off split end and rethread.
5. Improper assembly of guide system. (158, 160, 172, and 173).	5. Check for clearance in guide system. Loosen necessary screws and shift both strap leads with upper guide to obtain maximum strap gap width.
6. Solenoid gripper (103) not holding.	6. Inspect and clean gripper of any loose particles. Check solenoid operation. Replace gripper if worn.
7. Excessive camber in strapping.	7. Inspect and cut off cambered section.

TROUBLESHOOTING, Continued

#2 SYMPTOM: Strap escapes chute and continues to feed until the machine is shut off.	
CAUSE	**REMEDY**
1. Machine not in home position.	1. Reposition to home position.
2. Kinks in the strap.	2. Cut off kinked section of strap. Possible causes for kinks include permanent set from fold in drop out chamber and from being wrapped around traction wheels.
3. Gates stuck open.	3. Check gates for sufficient spring pressure and proper operation.

#3 SYMPTOM: Hesitation during welding.	
CAUSE	**REMEDY**
1. Lack of lubrication.	1. Lubricate vibrator shaft bushings and eccentric bearing.
2. Worn belts.	2. Check and replace.
3. Damaged eccentric bearing.	3. Check bearing and replace if damaged.
4. Low voltage.	4. Check and correct.

#4 SYMPTOM: Machine fails to stop in proper home position.	
CAUSE	**REMEDY**
1. Idler gear roller clutch (6A) is slipping.	1. Replace idler gear (6).
2. Micro-switch 1LS (218) is improperly adjusted.	2. Check for proper adjustment of actuator arm.
3. Belleville washers worn (9).	3. Replace washers (9).

#5 SYMPTOM: Motor fails to start.	
CAUSE	**REMEDY**
1. Overload relays tripped (272).	1. Reset overload button located in the control box.
2. No voltage present at motor terminal block.	2. Inspect for blown fuses, broken or loose wires, loose or disconnected prongs, etc.
3. Defective motor.	3. Replace motor.

#6 SYMPTOM: Machine continues running in feed direction, but fails to fill chute.	
CAUSE	**REMEDY**
1. Feedwheel (171) is slipping.	1. Replace worn feedwheel.
2. Strap stuck somewhere around dispenser.	2. Check dispenser.
3. Pinch rollers (162) are stuck.	3. Inspect pinch rollers (ball bearings) and eccentric shaft. Lubricate and/or replace if needed.
4. Out of strap.	4. Reload dispenser and machine. Make sure that strap chute is completely empty before reloading.
5. Slip clutch (57) is set too low.	5. Check slip clutch setting. Adjust slip clutch nut (54) if needed.
6. Jam in traction wheel area.	6. Pull strap out of machine, cut off damaged section, and reload. If unable to pull strap out, outer side plate (164) must be removed to get strap out.

#7 SYMPTOM: Machine pulls up tension but fails to go into welding cycle or hesitates noticeably before going into weld.	
CAUSE	**REMEDY**
1. One or both traction wheels (170 and 171) slipping.	1. Check, clean, replace traction wheels as needed. Cut off oily section or replace whole coil. Strap must be dry.
2. Tension too high.	2. Reduce tension.
3. Main drive belt slips.	3. Increase tension on belt.

#8 SYMPTOM: Machine continues to run in weld direction.	
CAUSE	**REMEDY**
1. Micro-switch (1LS) is improperly adjusted.	1. Readjust Micro-switch.
2. Switch arm stuck against machine cover.	2. Loosen four head mounting screws and shift head to gain clearance.

TROUBLESHOOTING, Continued

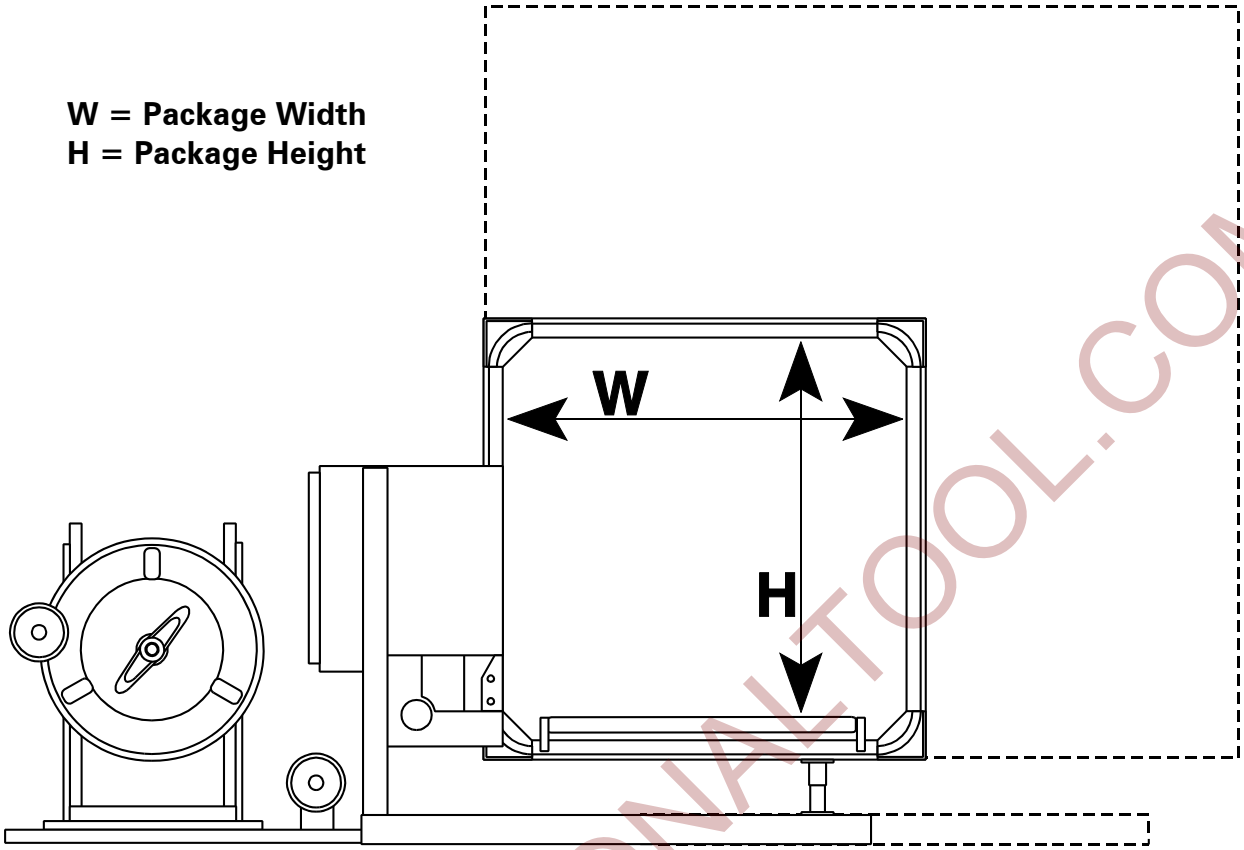
#9 SYMPTOM: Double welding. Immediately after completing cycle machine goes into another weld cycle.	
CAUSE	**REMEDY**
Drop-out arm (159) is stuck in open position.	Make sure drop-out arm is free and its pivot pin is lightly lubricated. Do not get lubricant on tension wheel (170).

#10 SYMPTOM: Strap escapes from stretch-out box during take-up.	
CAUSE	**REMEDY**
1. Too much strap being taken up.	1. Check package to chute ratio. Ratio should not exceed 5:1.
2. Strap does not accumulate in stretch-out box.	2. Strap is too stiff, add strap snubber kit #185298 to stretch-out box.

#11 SYMPTOM: Low or erratic tension.	
CAUSE	**REMEDY**
Slip clutch set too high.	Adjust slip clutch nut (54).

MODULAR CHUTE SYSTEM

W = Package Width
H = Package Height



INDIVIDUAL CHUTE SIZES BY ASSEMBLY PART NUMBER

HIGH FRAME, WITH SHORT VIBRATOR

	18"W	24"W	30"W	36"W	48"W	60"W	72"W
18"H	260200	260201	260202	260203	260204	260205	260206
24"H	260207	260208	260209	260210	260211	260212	260213

LOW FRAME, WITH STANDARD VIBRATOR

30"H	260287	260292	260214	260215	260301	260304	260307
36"H	260288	260293	260216	260217	260218	260219	260308
48"H	260289	260294	260220	260221	260222	260223	260309
60"H	260290	260295	260297	260299	260302	260305	260310
72"H	260291	260296	260298	260300	260303	260306	260311

Before attempting to assemble and install the chute, a thorough familiarization with the parts list, illustrations and all instructions is strongly recommended. When dealing with large chutes, we suggest all assembly work be done on the floor; the completed chute may then be raised and installed. Tools required:

- Two 9/16" open end wrenches
- One 3/16" hex key wrench
- One 1/8" hex key wrench, provided with kit

PREPARATION

To assist the assembler, all chute sections and gates have been letter coded and preassembled with the rubber springs. Make sure all like coded parts are matched and place each preassembled section in it's relative location. For low frame (short vibrator), Section D, install two gates coded B.

CHUTE ASSEMBLY

1. Firmly seat the chute corners, (13) onto the ends for the bottom and top chute sections (26 and 28), Sections B and D. Note that the direction of the arrows, cast into the plastic corners, must point in the strap feed direction, that is, clockwise as seen from the strap; loading side of the machine.

2. Slide two corner brackets (12) into both ends of the top and bottom sections (26 and 28), Sections B and D. Then slide the side sections (25 and 27), Sections A and C, onto the chute corners, passing the sections between the corner brackets, making sure the brackets enter the keyway of the section.

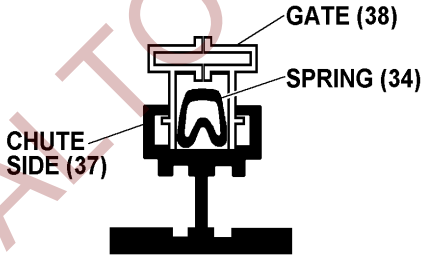
3. Loosely place all 5/16 set screws (5) in the corner brackets. Allowing a maximum gate freeplay of 1/16" between the chute corners, firmly tighten the set screws on the upside, then raise each corner and tighten the down side screws with the 1/8" hex key wrench provided.

At this point, the chute can be installed on the machine.

GATE TENSION ADJUSTMENT

With some chutes it may be necessary to adjust the gate tension to obtain the proper strap stripping action. To adjust the chute, each pair of gates can be removed by disassembling the chute corners and sliding the gates out.

Between each pair of gates are two rubber springs (34) as shown below; one at each end. Gates four feet long and over have an extra spring in the center. To keep the end springs from shifting towards center, the longer gates have been notched with a small tab.



Gate tension can be decreased by trimming the spring length or increased by adding an extra spring.

When re-assembling the chute, a light coating of talcum powder, rubbed onto the surface of the springs, will help the gates slide in and operate more easily.

To assure that the gates have been properly assembled, pull them apart and release. They must snap closed quickly and tightly. If they should fail to fully close, the rubber springs are not properly seated. Use a thin blunt instrument to push the spring fully down between the gates. Recheck for proper operation.

MODULAR CHUTE SYSTEM, Continued

CHUTE INSTALLATION

Remove the covers from the machine. Note that the head/frame assembly of an MCD-710 machine, without the support provided by the chute, has a tendency to lean forward. Therefore, the machine must be blocked beneath the slack box to maintain a perpendicular relationship between the head/frame assembly and the base. The importance of this step will become apparent when fastening the chute to the machine.

1. **All chutes require a chute-cap be attached to the head exit chute at the left hand side. This chute-cap is to be attached to the strapping head before the chute is affixed to the machine. Remove the vibrator shaft keeper and secure the chute-cap with the original 1/4 x 20 mounting screw using a 3/16 hex key wrench. This chute-cap will double as a keeper for the end of the chute with the head.**

2. **Refer to and comply with the details in the chute mounting variation section, seen in the exploded views, slide the conveyor brackets (14 or 19) onto the bottom chute, (Section D) and place the chute into position over the strapping head. Lightly secure the chute to the machine with the hardware supplied. Note that the conveyor mounting brackets closest to the head fit between the lower left corner chute mounting bolts and must be placed into position before the forward two bolts are placed.**

3. **Make sure the chute is mounted straight and the corners are square. Securely tighten the chute to the machine and remove the support from beneath the slack box.**

4. **Insert the conveyor rollers between the conveyor brackets and position the rollers where desired. Insert the set screws (7) in the brackets and tighten with the hex wrench (8) provided.**

5. **Replace the covers, start the machine, and test the chutes operation. If chute adjustments are required, make them at this time. Refer to the troubleshooting guide for assistance.**

6. **When the chute is operating properly it must be bolted together at the corners. Using the starting holes in the corner brackets (12) as guides, drill two 1/4" diameter clearance holes through the chute body at each corner. Install the cap screw (43) and locknuts (44) and securely tighten. The machine is now ready for use.**

PARTS LIST ASSEMBLIES, CHUTE

The following illustrations are a representation of all MCD chute configurations. Actual part sizes and lengths will vary. Each major component of the chute assembly has a unique key number. The following pages of this manual are the parts list for each assembly configuration as described on page 32 of this manual. Part numbers are then referenced by key on the appropriate parts list.

KEY	PART #	DESCRIPTION
1	002844	HHCS, 3/8-16 x 1-1/4
2	009069	Hex nut, 3/8-16
3	006243	Lockwasher, 3/8
4	009092	HHCS, 3/8-16 x 1-1/2
5	006978	Set screw, 1/4-28 x 5/16
6	006293	HHCS, 3/16 x 1
7	004361	Set screw, 1/4-28 x 7/16
8	257487	Allen wrench
9	260419	Facegate, Short vibrator (18" & 24" Chute heights)
	260418	Facegate, Std vibrator (30" 36" 48" 60" 72" Chute heights)
10	257483	Chute mounting bracket
11	257489	Chute cap
12	274482	Chute bracket
13	257469	Chute corner
14	257485	Bracket conveyor support
15	257488	Chute mounting bracket
16	257484	Chute mounting bracket
17	254952	Gate, left
18	254953	Gate, right
19	257478	Bracket, conveyor support
20	257476	Bracket, conveyor support
21	001601	Base extension
22	260312	Base extension
25	*	Chute, right
26	*	Chute, top
27	*	Chute, left
28	*	Chute, bottom
29	*	Gate, right
30	*	Gate, top
31	*	Gate, left
32	*	Gate, bottom
33	*	Conveyor roller
34	265503	Rubber spring
35	*	Conveyor roller
43	014571	SHCS, 1/4-20 x 1-1/4
44	015137	Locknut, 1/4-20

*** Variable component part, review matrix information shown on the following pages.**

VARIABLE CHUTE COMPONENTS

**** Two additional gate springs (Key 34) used.**

18" HIGH CHUTES

Key#	*18"Wide*		*24"Wide*		*30" Wide*		*36" Wide*		*48" Wide*		*60" Wide***		*72" Wide***	
25	1	260335	1	260335	1	260335	1	260335	1	260335	1	260335	1	260335
26	1	260337	1	260338	1	260330	1	260331	1	260332	1	260333	1	260334
27	1	260339	1	260339	1	260339	1	260339	1	260339	1	260339	1	260339
28	1	260334	1	260345	1	260346	1	260347	1	260348	1	260352	1	260361
29	2	260361	2	260361	2	260361	2	260361	2	260361	2	260361	2	260361
30	2	260368	2	260369	2	260363	2	260364	2	260365	2	260366	2	260367
31	2	260370	2	260370	2	260370	2	260370	2	260370	2	260370	2	260370
32	2	260380	2	260381	2	260382	2	260383	2	260384	2	260385	2	260386
33	2	59356	2	260376	2	260377	2	260378	2	260379	2	260377	2	260378
34	-	-	-	-	-	-	-	-	-	-	2	260376	2	260377

24" HIGH CHUTES

Key#	*18"Wide*		*24"Wide*		*30" Wide*		*36" Wide*		*48" Wide*		*60" Wide***		*72" Wide***	
25	1	260336	1	260336	1	260336	1	260336	1	260336	1	260336	1	260336
26	1	260337	1	260338	1	260330	1	260331	1	260332	1	260333	1	260334
27	1	260340	1	260340	1	260340	1	260340	1	260340	1	260340	1	260340
28	1	260334	1	260345	1	260346	1	260347	1	260348	1	260352	1	260361
29	2	260362	2	260362	2	260362	2	260362	2	260362	2	260362	2	260362
30	2	260368	2	260369	2	260363	2	260364	2	260365	2	260366	2	260367
31	2	260371	2	260371	2	260371	2	260371	2	260371	2	260371	2	260371
32	2	260380	2	260381	2	260382	2	260383	2	260384	2	260385	2	260386
33	2	59356	2	260376	2	260377	2	260378	2	260379	2	260377	2	260378
34	-	-	-	-	-	-	-	-	-	-	2	260376	2	260377

30" HIGH CHUTES

Key#	*18"Wide*		*24"Wide*		*30" Wide*		*36" Wide*		*48" Wide*		*60" Wide***		*72" Wide***	
25	1	260325	1	260325	1	260325	1	260325	1	260325	1	260325	1	260325
26	1	260337	1	260338	1	260330	1	260331	1	260332	1	260333	1	260334
27	1	260339	1	260339	1	260339	1	260339	1	260339	1	260339	1	260339
28	1	260416	1	260417	1	260349	1	260350	1	260351	1	260354	1	260355
29	2	260356	2	260356	2	260356	2	260356	2	260356	2	260356	2	260356
30	2	260368	2	260369	2	260363	2	260364	2	260365	2	260366	2	260367
31	2	260370	2	260370	2	260370	2	260370	2	260370	2	260370	2	260370
32	-	-	-	-	-	-	-	-	-	-	-	-	-	-
33	2	260375	2	260376	2	260377	2	260378	2	260379	2	260377	2	260378
34	-	-	-	-	-	-	-	-	-	-	2	260376	2	260377

MODULAR CHUTE SYSTEM. Continued

36" HIGH CHUTES

Key#	18"Wide		24"Wide		30" Wide		36" Wide		48" Wide		60" Wide**		72" Wide**	
25	1	260326	1	260326	1	260326	1	260326	1	260326	1	260326	1	260326
26	1	260337	1	260338	1	260330	1	260331	1	260332	1	260333	1	260334
27	1	260340	1	260340	1	260340	1	260340	1	260340	1	260340	1	260340
28	1	260416	1	260417	1	260349	1	260350	1	260351	1	260354	1	260355
29	2	260357	2	260357	2	260357	2	260357	2	260357	2	260357	2	260357
30	2	260368	2	260369	2	260363	2	260364	2	260365	2	260366	2	260367
31	2	260371	2	260371	2	260371	2	260371	2	260371	2	260371	2	260371
32	-	-	-	-	-	-	-	-	-	-	-	-	-	-
33	2	260375	2	260376	2	260377	2	260378	2	260379	2	260377	2	260378
34	-	-	-	-	-	-	-	-	-	-	2	260376	2	260377

48" HIGH CHUTES

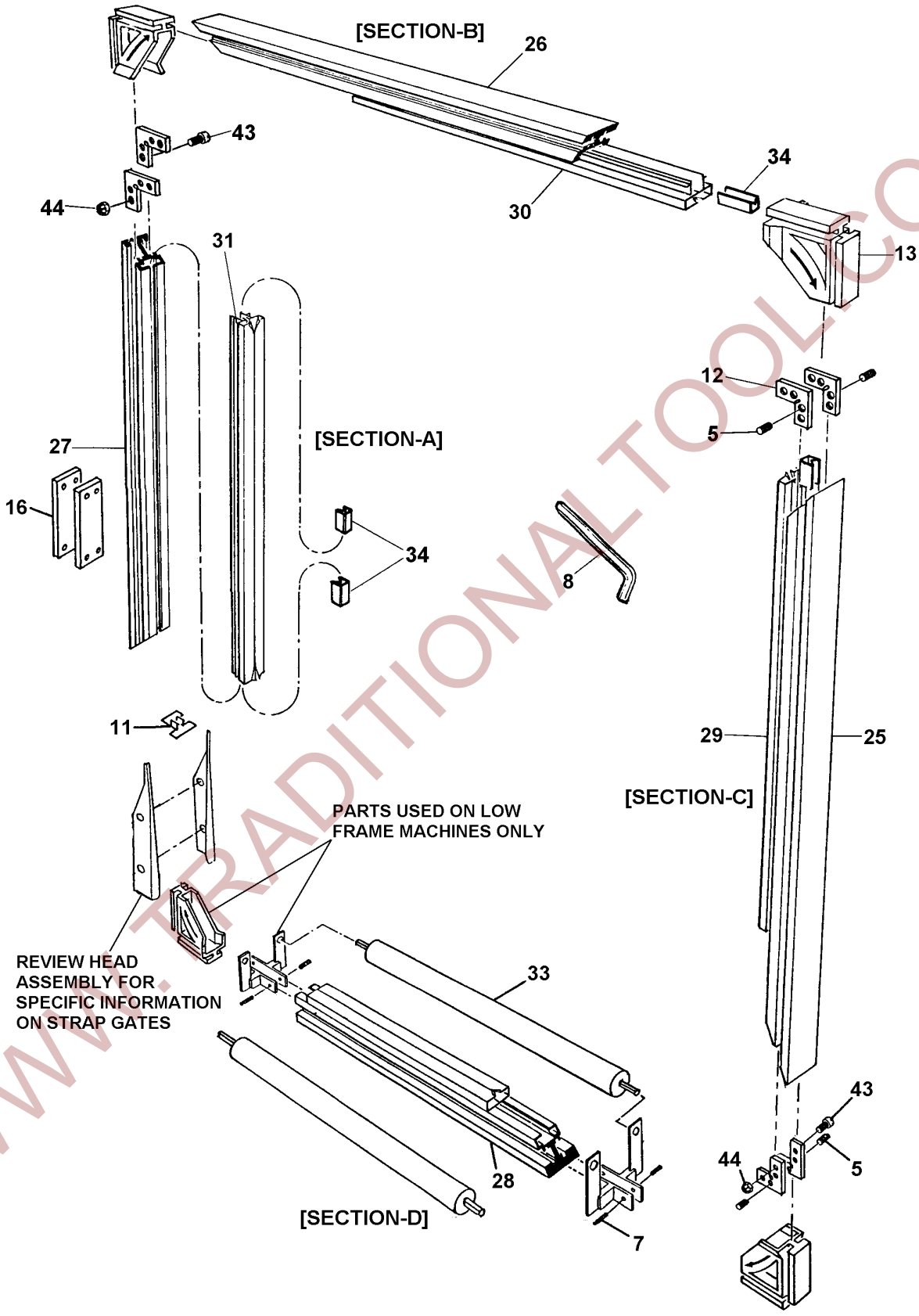
Key#	18"Wide		24"Wide		30" Wide		36" Wide		48" Wide		60" Wide**		72" Wide**	
25	1	260327	1	260327	1	260327	1	260327	1	260327	1	260327	1	260327
26	1	260337	1	260338	1	260330	1	260331	1	260332	1	260333	1	260334
27	1	260341	1	260341	1	260341	1	260341	1	260341	1	260341	1	260341
28	1	260416	1	260417	1	260349	1	260350	1	260351	1	260354	1	260355
29	2	260358	2	260358	2	260358	2	260358	2	260358	2	260358	2	260358
30	2	260368	2	260369	2	260363	2	260364	2	260365	2	260366	2	260367
31	2	260372	2	260372	2	260372	2	260372	2	260372	2	260372	2	260372
32	-	-	-	-	-	-	-	-	-	-	-	-	-	-
33	2	260375	2	260376	2	260377	2	260378	2	260379	2	260377	2	260378
34	-	-	-	-	-	-	-	-	-	-	2	260376	2	260377

60" HIGH CHUTES

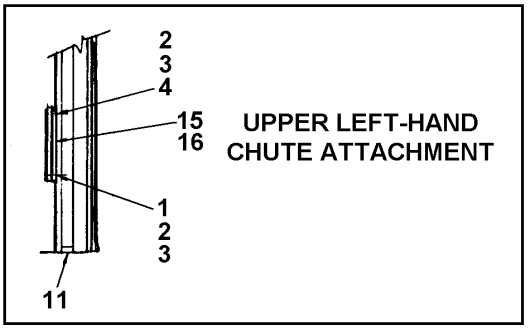
Key#	18"Wide		24"Wide		30" Wide		36" Wide		48" Wide		60" Wide**		72" Wide**	
25	1	260328	1	260328	1	260328	1	260328	1	260328	1	260328	1	260328
26	1	260337	1	260338	1	260330	1	260331	1	260332	1	260333	1	260334
27	1	260342	1	260342	1	260342	1	260342	1	260342	1	260342	1	260342
28	1	260416	1	260417	1	260349	1	260350	1	260351	1	260354	1	260355
29	2	260359	2	260359	2	260359	2	260359	2	260359	2	260359	2	260359
30	2	260368	2	260369	2	260363	2	260364	2	260365	2	260366	2	260367
31	2	260373	2	260373	2	260373	2	260373	2	260373	2	260373	2	260373
32	-	-	-	-	-	-	-	-	-	-	-	-	-	-
33	2	260375	2	260376	2	260377	2	260378	2	260379	2	260377	2	260378
34	-	-	-	-	-	-	-	-	-	-	2	260376	2	260377

72" HIGH CHUTES

Key#	18"Wide		24"Wide		30" Wide		36" Wide		48" Wide		60" Wide**		72" Wide**	
25	1	260329	1	260329	1	260329	1	260329	1	260329	1	260329	1	260329
26	1	260337	1	260338	1	260330	1	260331	1	260332	1	260333	1	260334
27	1	260343	1	260343	1	260343	1	260343	1	260343	1	260343	1	260343
28	1	260416	1	260417	1	260349	1	260350	1	260351	1	260354	1	260355
29	2	260360	2	260360	2	260360	2	260360	2	260360	2	260360	2	260360
30	2	260368	2	260369	2	260363	2	260364	2	260365	2	260366	2	260367
31	2	260374	2	260374	2	260374	2	260374	2	260374	2	260374	2	260374
32	-	-	-	-	-	-	-	-	-	-	-	-	-	-
33	2	260375	2	260376	2	260377	2	260378	2	260379	2	260377	2	260378
34	-	-	-	-	-	-	-	-	-	-	2	260376	2	260377

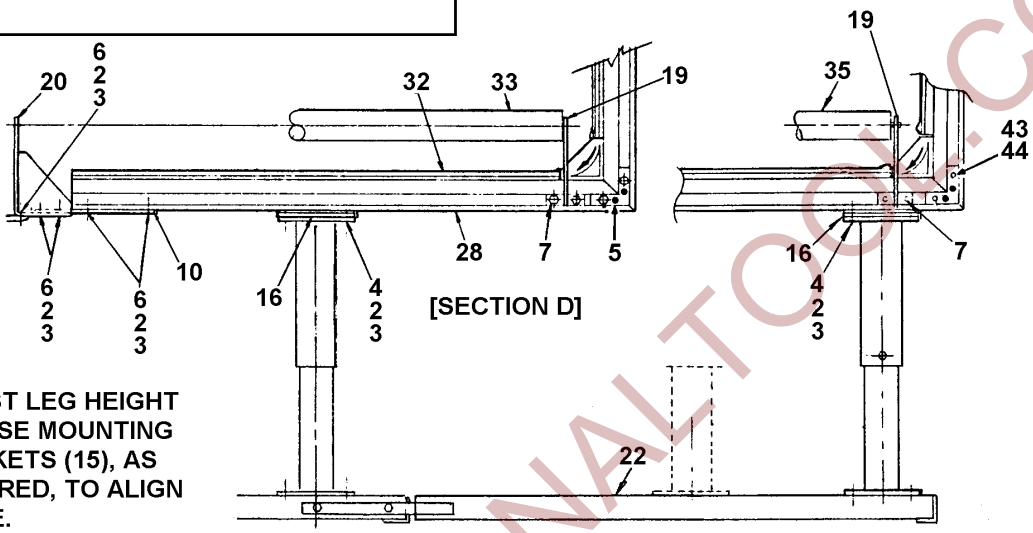


MODULAR CHUTE SYSTEM. Continued



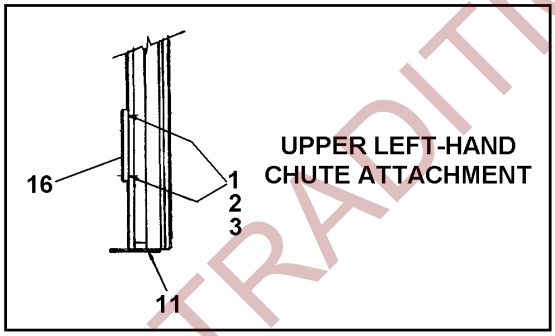
UPPER LEFT-HAND CHUTE ATTACHMENT

HIGH FRAME



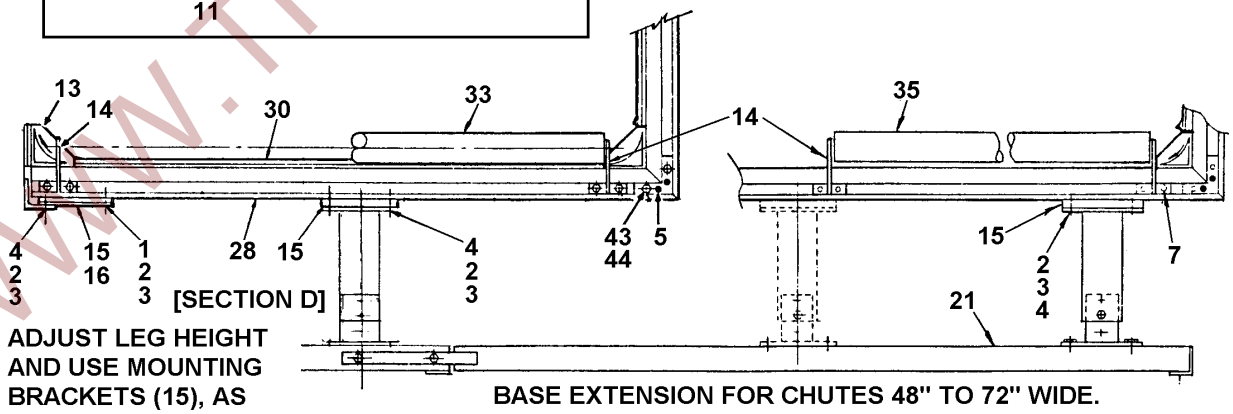
ADJUST LEG HEIGHT AND USE MOUNTING BRACKETS (15), AS REQUIRED, TO ALIGN CHUTE.

BASE EXTENSION FOR CHUTES 48" TO 72" WIDE.



UPPER LEFT-HAND CHUTE ATTACHMENT

LOW FRAME



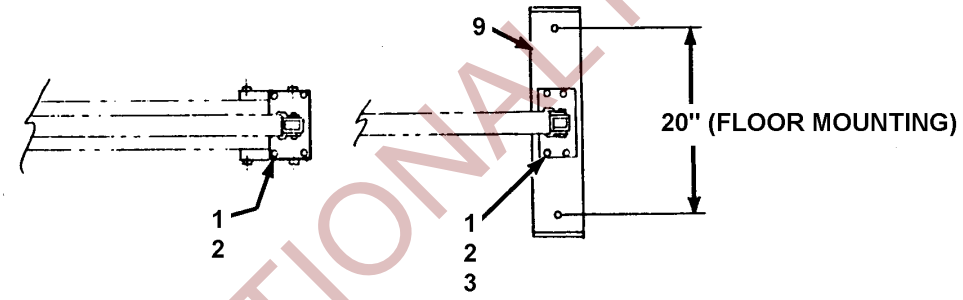
ADJUST LEG HEIGHT AND USE MOUNTING BRACKETS (15), AS REQUIRED, TO ALIGN CHUTE.

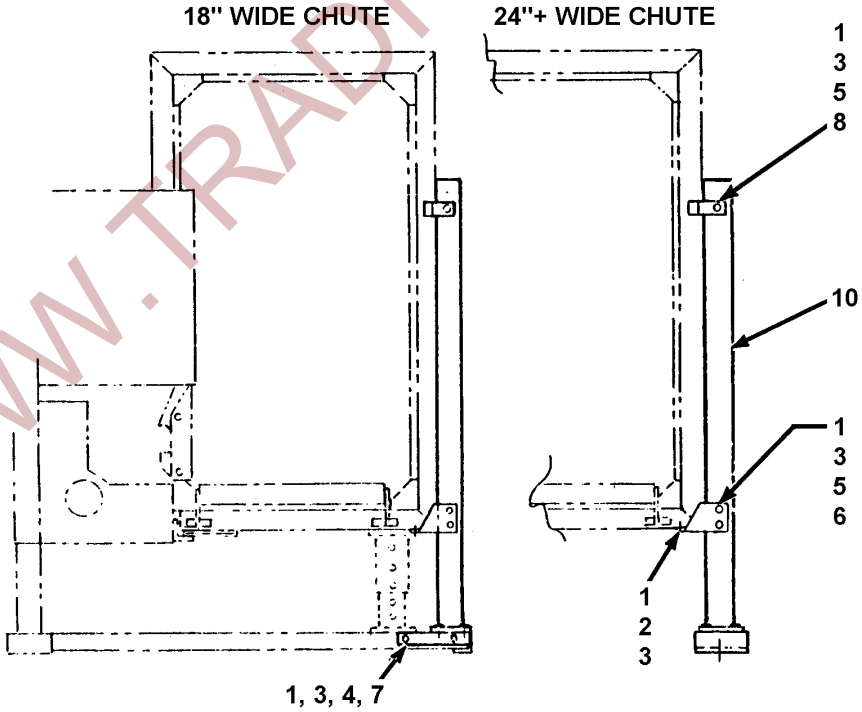
BASE EXTENSION FOR CHUTES 48" TO 72" WIDE.

OPTIONAL CHUTE SUPPORT INSTALLATION

1. Refer to the side view to install the chute support assembly. Note that holes must be added to the bottom chute section to attach the bottom chute support bracket (6).
2. If the chute is 18 inches wide, remove the leg and install the mounting bars (7) on the frame. Mount the support, less base, (9) on the mounting bars as shown.
3. If desired, the height of the support may be cut down if it extends above the chute.
4. Holes have been provided in the support base (9) for anchoring to the floor or attaching casters.

KEY	QTY	PART #	DESCRIPTION
1	13	006243	Lockwasher, 3/8
2	6	006293	HHCS, 3/8-16 x 1
3	13	009069	Standard nut 3/8-16
4	4	009092	Cap screw
5	3	014980	Long hex head cap screw
6	1	260445	Chute bracket
7	2	260447	Support mounting bar
8	2	260451	Bracket
9	1	260452	Base weldment
10	1	260453	Support weldment





TROUBLESHOOTING, MODULAR CHUTE

The following items are the most common machine symptoms if problems occur. For symptoms or remedies not shown, contact your Signode service representative for additional information and details. The following machine symptoms are shown in this manual:

#1 Edges of strap fray or develop "hairs". Feed and tension wheels tangled with "hairs".
#2 Strap snags or catches at plastic chute corners. Strap does not feed around chute.
#3 Strap trapped in chute gate or upper strap guide. Strap does not feed around chute.
#4 End of strap escapes form chute during feed cycle.
#5 Strap "bubbles out" from chute entry and continues to feed after chute is filled.
#6 On high packages, strap fails to release form head at end of cycle.

#1 SYMPTOM: Edges of strap fray or develop "hairs". Also feed and tension wheels become tangled with "hairs".	
CAUSE	**REMEDY**
1. During tension cycle strap passes over burrs or sharp edges of gate.	1. Inspect and remove burrs and/or sharp edges on gate. Replace gate only if burrs cannot be dressed properly.
2. Tension of gate spring is too high.	2. Trim small amounts off the lengths of the rubber springs with a sharp knife or scissors.

#2 SYMPTOM: Strap snags or catches at plastic chute corners. Strap does not feed completely around chute.	
CAUSE	**REMEDY**
1. Plastic corner installed backwards. Arrow on corner does not point in direction of strap feed.	1. Disassemble corner and reassemble with arrow pointing in the feed direction.
2. Gap between chute corner and gate is too large. Maximum gap should be 1/16".	2a. Verify that proper gates have been installed. 2b. Loosen set screws and bolts on corner brackets and adjust corner alignment to reduce gap. 2c. Loosen chute-to-frame mounting bolts and compress chute section to reduce gap.

#3 SYMPTOM: Strap trapped in chute gate or upper strap guide. Strap does not feed completely around chute.	
CAUSE	**REMEDY**
1. Obstruction in chute gate. 2. Strap has excessive twist, camber or curl. 3. Chute-to-package ratio too large causing excessive camber in strap. 4. Drop-out arm activates 2LS switch before feed cycle is complete.	1. Open gate and clean out any obstruction. 2. Pay-off several yards of strap from dispenser and refeed machine. 3. Consult with Signode equipment specialist. 4. Change/Add booster spring as required from Kit #431999 which contains 5 springs of varying strength.

#4 SYMPTOM: End of strap escapes form chute during feed cycle.	
CAUSE	**REMEDY**
1. Strap has upward curl (towards inside of chute). 2. Chute not aligned with head.	1. Remove strap and turn strap over. Refeed machine. 2a. Check that chute cap, 257489, is located properly and mounted to head. 2b. Check that chute has proper spacing and is shimmed correctly. 2c. Make sure the head assembly is vertical and not leaning forward.

#5 SYMPTOM: Strap "bubbles out" from chute entry and continues to feed after chute is filled.	
CAUSE	**REMEDY**
1. Chute assembly not properly aligned. 2. Drop out arm does not actuate 2LS switch.	1. Verify that gaps between chute sections is not excessive. 2. Change/Add booster spring as required from Kit #431999 which contains 5 springs of varying strength.

#6 SYMPTOM: On high packages, strap fails to release form head at end of cycle.	
CAUSE	**REMEDY**
Strap tension set too low.	Increase tension setting. Check specifications for minimum strap tension.

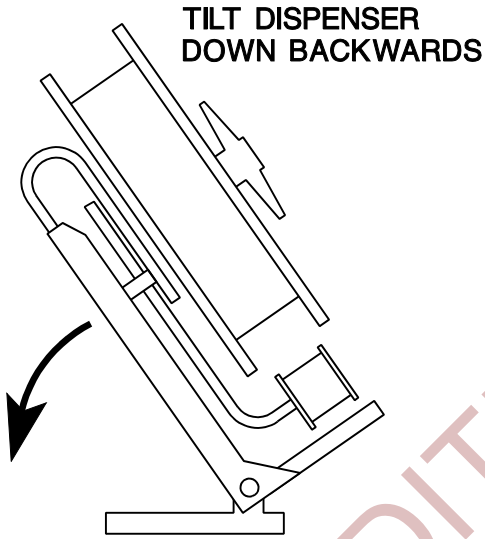
DF1-12D DISPENSER LOADING, THREADING AND ADJUSTING INSTRUCTIONS

⚠WARNING

Make sure the power strapping machine has been turned OFF. Failure to do so can result in personal injury.

To load a coil of strap in the DF1-12D Dispenser, follow the steps below:

1. **Release the dispenser pivot latch and tilt the dispenser back 90° to the horizontal position. Turn the wing nut CCW and lift the outer reel disc assembly from the dispenser.**

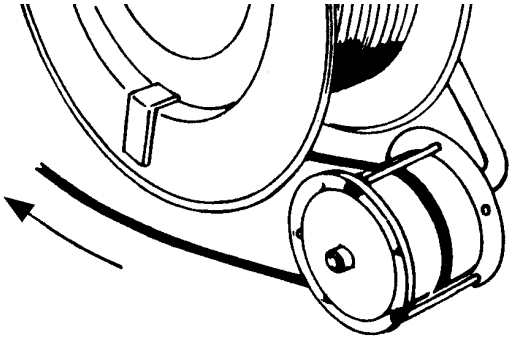


2. **Remove the plastic film from the coil's INSIDE diameter only, following the perforations on the sides of the coil. But before installing the coil of strap, note the direction of pay-off of the lead end. The lead end of the strap should point in the direction of the arrow affixed to the inside of the reel disc assembly.**
3. **Lower the new coil over the central hub and, if installing a coil of Dymax strap, position the three retaining ties above the three indentations. This will facilitate tie removal.**
4. **Reinstall the outer reel disc assembly, making sure the stud attached to the rear disc assembly protrudes through the hole of the outer disk, then SNUG the wing nut.**
5. **If installing a coil of Dymax strap, cut and remove the three ties from the coil then remove the piece of tape used to contain the lead end to the outside of the coil. If installing a coil of Contrax or Tenax strap, remove the shrink film, the small piece of tape and the corrugated belly band.**
6. **Securely tighten the wing nut.**

⚠WARNING

The wing nut must be tight. Failure to do so can result in personal injury.

7. **Lift the dispenser to the upright position, making sure the pivot latch has locked the dispenser in the upright position. The dispenser is ready to be threaded.**
8. **Make sure there are no twists or kinks in the strap. Lead it back towards the dancer arm drum and feed it around the drum as shown below.**



9. **Bring the lead end of the strap up from around the bottom of the drum, pull it forward and insert the strap in the power strapping machine.**

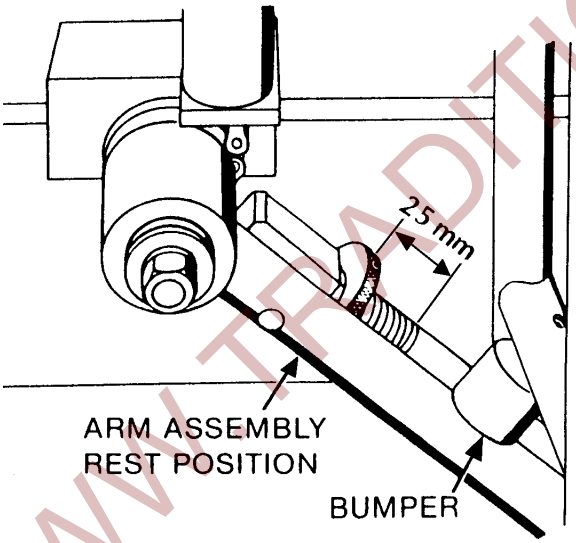
OPERATION AND ADJUSTMENTS
(Refer to the exploded views for key number identification)

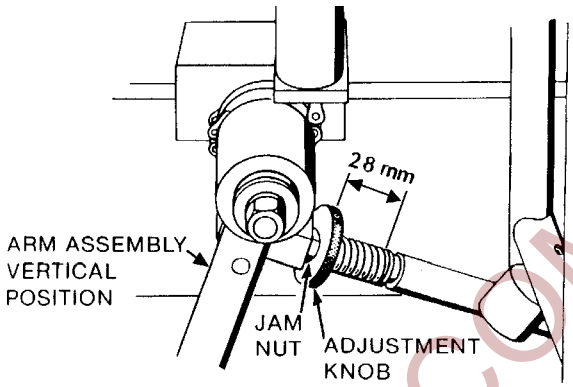
As strap is pulled from the dispenser, the dancer arm swings forward to allow the coil to rotate and pay-off the strap. The forward motion of the dancer arm is gradually absorbed by a compression spring (19) and the arm should stop within an inch of contacting the forward stop bumper (11). If, with a full coil of strap, the arm impacts the bumper, increase the spring pressure by turning the spring plunger (18) clockwise. A nominal setting of the spring plunger will result in it being positioned about 7/8" below the top of the spring housing (14) when the arm is in contact with the bumper (11).

If less tension is required, turn the plunger counterclockwise but never loosen it beyond the retaining screw (17).

As the arm swings back, a brake is applied to the outer rim of the back disc assembly (7). The brake should stop the coil from rotating. If the coil is not stopped quickly enough and three or four loose wraps of strap appear on the coil, the brake will have to be adjusted.

To adjust the brake refer to the illustrations and the steps below:





1. **Hold the dancer arm assembly (24) in a vertical position and measure the length of the compression spring (33). The spring should not be compressed with the dancer arm vertical. The spring should measure 1 1/8" (28mm).**

2. **Loosen the set screw (31) in the knurled adjustment knob (32) then loosen the jam nut (30). This will allow the adjustment knob (32) to be rotated.**

3. **Move the dancer arm forward until it contacts the bumper (11) and remeasure the length of the compression spring (33). It should measure 1" (25mm). If it measures something other than 1", move the arm to the vertical position and rotate the adjustment knob in the direction needed to obtain the 1" (25mm) dimension.**

4. **When set, tighten the jam nut (30) and the set screw (31).**

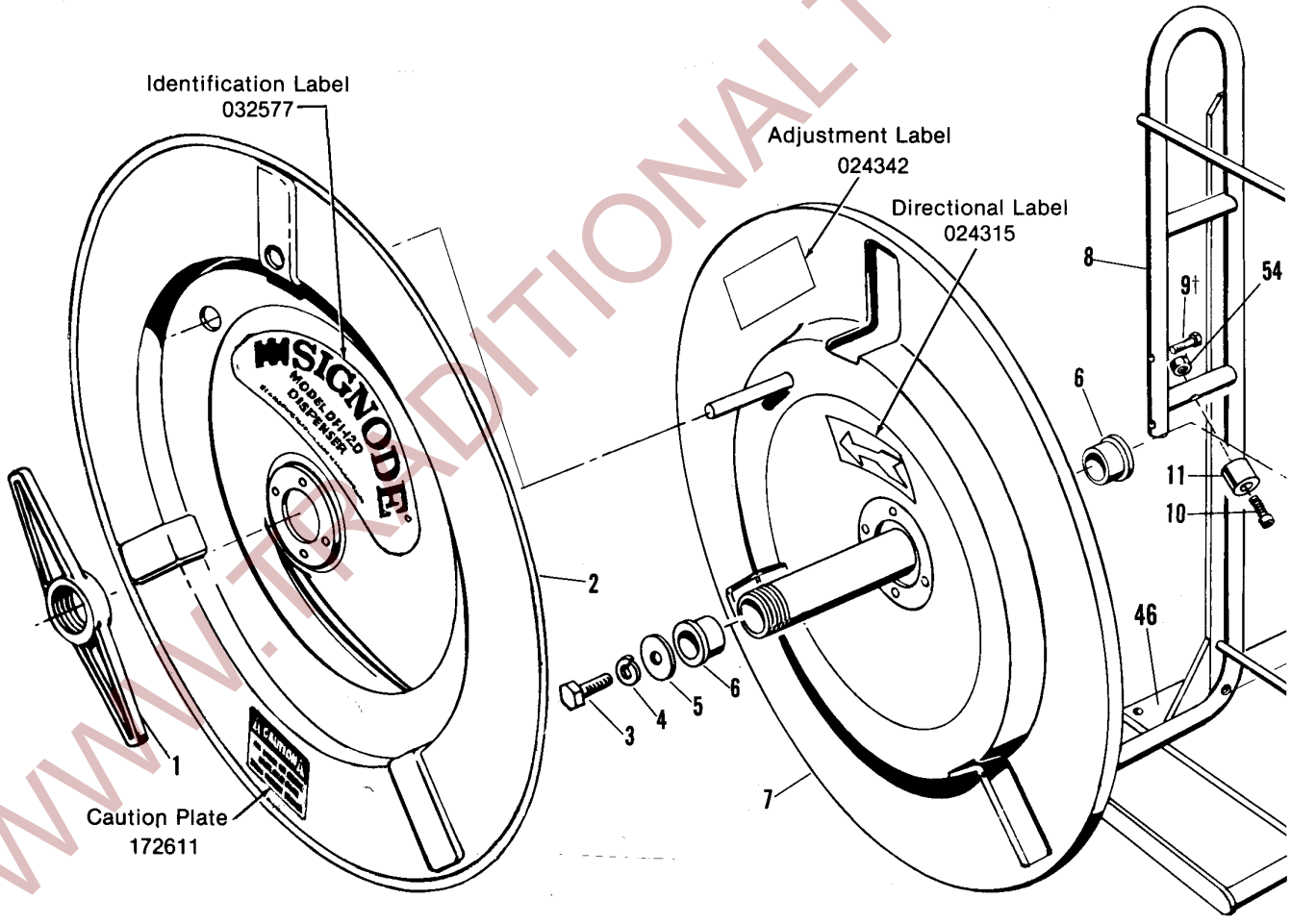
5. **Note that the brake block (43) contacts the outer flange with about fifty percent of the length of the block. This means that the block can be turned and reused in four positions, greatly extending the life of the block.**

   To properly position the block, place a 1/16" spacer between the lower part of the block and the disc flange, then securely tighten the mounting screw (42) and the lock nut (45). Remove the spacer.

PARTS LIST, DF1-12D DISPENSER

KEY	QTY	PART #	DESCRIPTION
1	1	067222	Nut
2	1	024321	Reel disc assy.
3	2	009094	HHCS, 1/2-13 x 1
4	2	002434	Spring lock washer, 1/2
5	2	024382	Washer, 7/16 std.
6	4	024352	Bushing
7	1	024380	Back disc assy.
8	1	024327	Pipe stand assy.
9	4	024357	HHCS, 3/8-16 x 1 3/4
10	2	009042	SHCS, 1/4-20 x 1
11	2	024301	Bumper
12	1	024325	Main plate assy.
13	1	009839	Flat pt. SSS, 5/16-24 x 1/2
14	1	024336	Spring housing
15	2	002187	Spring lock washer, 1/4
16	2	004234	HHCS, 1/4-20 x 3/4
17	1	024220	SHCS, 5/16-18 x 5/8

KEY	QTY	PART #	DESCRIPTION
18	1	024337	Spring plunger
19	1	024381	Spring
20	1	024338	Spring screw
21	2	024349	Connecting link
22	1	024314	Chain
23	1	024377	Shaft
24	1	002399	Drum arm assy.
25	1	002805	Cotter pin, 1/8 x 3/4
26	1	004192	Washer, 1/2 SAE
27	1	024328	Pivot
28	1	024311	Brake link
29	1	024350	ShS, 3/8 x 3/4
30	1	024353	Jam nut, 3/8-16
31	1	024356	SHSS, 10-24 x 3/8 cup point.
32	1	024302	Adjustment knob
33	1	024344	Spring
34	1	007453	Washer, 3/8 plain

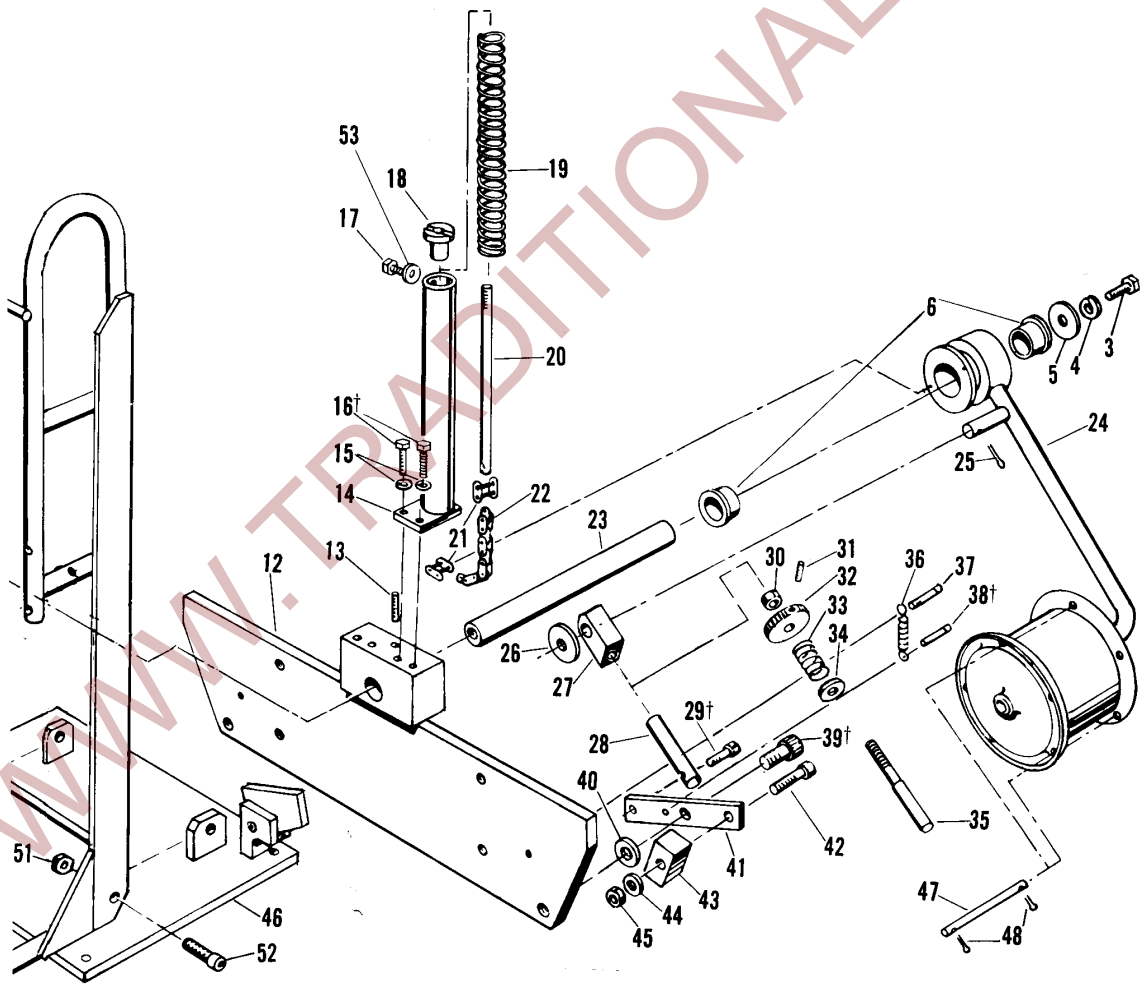


KEY	QTY	PART#	DESCRIPTION
35	1	024312	Brake rod
36	1	024346	Extension spring
37	2	024348	Pin
38	1	024347	Pin
39	1	024351	ShS, 1/2 x 5/8
40	1	024355	Washer, 5/16 SAE
41	1	024309	Brake arm
42	1	014829	SHCS, 5/16-18 x 3
43	1	024310	Brake block
44	1	006720	Washer, 5/16 std.
45	1	005211	Lock nut, 5/16-18
46*	1	024360	Base assy. (optional)
47	2	031326	Guide pin
48	4	002164	Cotter pin, 1/16 x 1/2
49	1	024366	Pulley, long pay-off arm (optional), not shown
50	1	014490	Pulley, short pay-off arm (optional), not shown

KEY	QTY	PART #	DESCRIPTION
51	2	009069	Hex nut, 3/8-16
52	2	020241	SHCS, 3/8-16 x 2 1/4
53	1	002188	Split lock washer, 5/16

- When ordering parts, please show model, part number and name.
- Common hardware parts may be obtained at any local hardware supply.
- Wearing parts are usually limited to those underlined and should be stocked.

* This assembly includes 2 hex nuts (009069) and 2 socket head cap screws (020241), as illustrated.



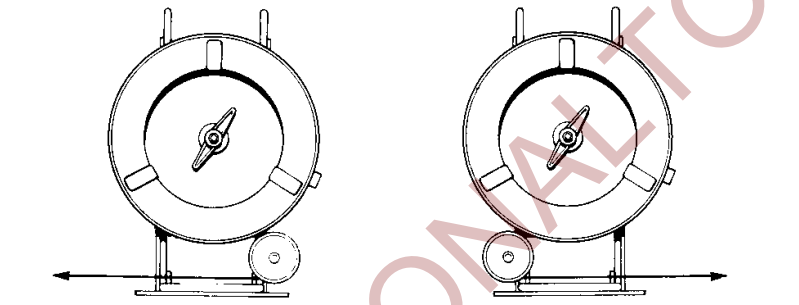
DF1-12D CONVERSION INSTRUCTIONS

LEFT HAND STRAP PAY-OFF

To convert the DF1-12D to pay-off strap from the left hand side, follow the steps below:

1. **Transfer the stop bumper (11) to the other side of the frame.**
2. **Remove the mounting screw (39) then carefully remove mounting screws (16) and connecting link (21). Move the spring housing to the alternate position.**
3. **Move the brake linkage parts to the opposite side and resecure in place with the mounting screw (39).**
4. **Adjust the brake by following the adjustment instructions in this section.**
5. **Move the guide pins (47) to the opposite side of the drum on the arm assembly (24).**
6. **To avoid confusion when threading the strap, remove the directional arrow.**

   Note: An application of light machine oil to all moving parts at a frequent interval will result in ease of operation and provide longer service.



LEFT HAND TAKE-OFF (as stocked)

RIGHT HAND TAKE-OFF (as converted)

MCD MACHINE OPTIONS

The following machines options are available for most MCD configurations. Listed below are the individual options and related information. Detailed information and details about options may be referenced to various pages throughout this manual. Contact your local Signode sales representative for product application and availability.

- **MCD-710/310 OPERATORLESS INTERLOCK - This option allows the MCD to operate interactively with existing customer equipment. See pages 12 & 13 for information and details.**

- **CHUTE SUPPORT - To add rigidity to the larger chute sizes a chute support kit can be attached to the existing chute. See pages 43 for information and details.**

- **TENAX STRAP CONVERSION (MCD-510), KIT NO. 165782 - The MCD machine can be converted to run Signode Tenax strapping. This option is only available with standard vibrator machines. The following parts are replaced on the standard MCD-710:**

  Inner race assembly, Part No. 009884, Page 16, Key 29.
  Spring, Part No. 163356, Page 18, Key 138.
  Spring, Part No. 160574, Page 18, Key 142.

- **STRAP SNUBBER, KIT NO. 185298 - This kit is intended for use with machines which have been converted to use Signode Tenax strapping. The strap snubber kit is used to keep excess strapping from coming out of the MCD strap accumulator. See pages 22 & 23 for information and details.**

- **90° DISPENSER MOUNT, KIT NO. 059213 - This option allows the MCD dispenser to be alternately installed 90° from the standard position. This alternate position may be beneficial for MCD machines which are operated in cramped/confined areas. See pages 28 & 29 for additional information and details.**