OPERATION - MAINTENANCE & PARTS MANUAL

MACHINE MODEL
CF25-T CASE ERECTOR

THE LOVESHAW CORPORATION
2206 EASTON TURNPIKE, BOX 83
SOUTH CANAAN, PA. 18459

APRIL 2010

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GENERAL SAFETY PRECAUTIONS

BEFORE INSTALLING, OPERATING, OR SERVICING THIS EQUIPMENT, READ THE FOLLOWING PRECAUTIONS CAREFULLY:

1. THIS MACHINE IS EQUIPPED WITH MOVING PARTS. DO NOT PLACE HANDS IN THE MACHINE WHEN PARTS ARE MOVING. ALWAYS USE A ROLLER-TYPE EXIT CONVEYOR, AND ALWAYS REMOVE BOXES AFTER THEY CLEAR THE EXIT END OF THE MACHINE.

2. USE CAUTION WHEN NEAR CARTRIDGE KNIFE OR WHEN THREADING TAPE. THE KNIFE IS VERY SHARP, AUTOMATICALLY OPERATED AND LINKED TO THE WIPE-DOWN ROLLERS.

3. DO NOT ATTEMPT TO OPEN OR WORK ON THE ELECTRICAL BOX, JUNCTION BOXES, OR OTHER ELECTRICAL COMPONENTS WITHOUT FIRST DISCONNECTING POWER TO THE MACHINE. SHOCK HAZARD EXISTS IF THE POWER IS NOT DISCONNECTED.

4. DO NOT BYPASS ANY DESIGNED-IN SAFETY FEATURES SUCH AS INTERLOCKS, GUARDS OR SHIELDS.

5. DO NOT PLACE HANDS OR BODY INSIDE CONFINES OF MACHINE WHILE IT IS RUNNING.

6. ALWAYS DISCONNECT POWER SOURCE AND AIR SUPPLY (IF APPLICABLE) BEFORE SERVICING MACHINE.

7. SAFETY GLASSES SHOULD BE WORN WHEN WORKING ON OR AROUND MACHINE.

INSTALLATION PROCEDURE

- EXERCISE CARE WHEN HANDLING THIS MACHINE, A SUDDEN JOLT OR JAR MAY CAUSE SERIOUS DAMAGE.

- DO NOT REMOVE THE SHIPPING SKID UNTIL MACHINE HAS BEEN MOVED TO A POINT OF INSTALLATION. THE SKID IS DESIGNED FOR EASY AND SAFE HANDLING OF YOUR MACHINE.

- TRANSFER THE MACHINE FROM THE SHIPPING SKID TO THE FACTORY FLOOR BY LIFTING IT WITH A FORK LIFT. APPROACH THE MACHINE FROM THE SIDE AND CAREFULLY POSITION THE FORKS UNDER THE FRAME. LOCATE THE FORKS IN THE CENTER ON THE MACHINE, SO THAT THEY LIFT ON THE MAIN FRAME FLANGES. TAKE CARE THAT THE FORKS DO NOT LIFT ON ANY SUB-ASSEMBLIES AS THEY MAY BE DAMAGED BY THE FORCE.

- USE JACK SCREWS (1/2-13UNC X 3” LG) IN EACH LEG TO LEVEL THE MACHINE.

- A GREAT DEAL OF TROUBLE MAY BE CAUSED IF THE CURRENT IS SUPPLIED BY LINES WHICH ARE NOT HEAVY ENOUGH. IF THIS OCCURS, THE CONTROLS CANNOT OPERATE AT THEIR FULL CAPACITY AND OVER HEATING MAY RESULT. A SIMILAR CONDITION WILL EXIST IF POOR ELECTRICAL CONNECTIONS ARE MADE. IT’S THEREFORE WORTHWHILE TO MAKE SURE THAT EVERYTHING IS ELECTRICALLY CORRECT.

- ELECTRICAL POLARITY MUST BE SUPPLIED TO THE MACHINE EXACTLY AS SHOWN ON THE ELECTRICAL DIAGRAM. POWER MUST BE SUPPLIED TO THE L1 SIDE OF THE CIRCUIT, AND THE L2 SIDE WILL BE NEUTRAL.

- THE COMPRESSED AIR SUPPLIED TO THE MACHINE SHOULD BE CLEAN AND DRY AS THE FILTER IS ONLY MEANT TO REMOVE MINOR PARTICLES OR SLIGHT AMOUNTS OF MOISTURE IN THE AIR LINE. DIRT OR MOISTURE CAN CAUSE ERRATIC OPERATION OR FAILURE OF CONTROL VALVES.

- CONNECT AIR SUPPLY TO AN AIR SOURCE WITH A MINIMUM LINE PRESSURE OF 80 PSI.

- BEFORE STARTING THE MACHINE, LOAD A NEW ROLL ON TAPE ON THE CARTRIDGE AND THREAD THE TAPE ACCORDING TO THE ARROWS ON THE UNIT.

- FOR PROPER START-UP PROCEDURE, SEE THE START-UP PROCEDURE SECTION OF THIS MANUAL.

MACHINE SPECIFICATIONS

MACHINE MODEL:	CF25-T CASEFORMER
STANDARD DISCHARGE HEIGHT:	23”
AMERICAN ELECTRICAL REQUIREMENTS:	
PRIMARY VOLTAGE:	110 VOLTS, 1 PHASE, 60 HERTZ
CONTROL VOLTAGE:	110 VOLTS, 1 PHASE, 60 HERTZ
CASE CAPACITY:	
LENGTH:	6” (152 mm) MIN. TO 16” (406 mm) MAX.
WIDTH:	6” (152 mm) MIN. TO 14” (305 mm) MAX.
HEIGHT:	4” (102 mm) MIN. TO 12” (305 mm) MAX.
MACHINE SPEED:	10 CASES PER / MIN. STANDARD UP TO 15 CPM OPTIONAL
CLOSURE MATERIAL:	2” OR 3” PRESSURE SENSITIVE TAPE
MAXIMUM ROLL DIAMETER:	15”
AIR REQUIREMENTS:	15 S.C.F.M. AT 80 PSI.
MACHINE OPTIONS:	1. SPARE PARTS KIT 2. SPECIAL ELECTRONICS 3. CUSTOM COLOR 4. CASTERS 5. LOW TAPE ALARM 6. LOW HOPPER ALARM 7. BOX JAM ALARM 8. LEG EXTENSIONS 9. HIGH SPEED (15 CPM)
WEIGHT:	1100 lb. (409 kg.) - (uncrated)

SEQUENCE OF OPERATION

1. INITIAL CONDITION OF MACHINE: HOPPER FILLED WITH BLANKS (BOXES THAT ARE IN THEIR FOLDED STATE, NOT OPEN). EMERGENCY STOP PUSH BUTTON RE-SET, ELECTRICAL AND COMPRESSED AIR POWER TURNED ON, MACHINE MODE SELECTOR SWITCH TURNED ON TO RUN POSITION, SAFETY GUARDS CLOSED.

2. DEPRESS THE START PUSH BUTTON.

3. IF NOT ALREADY IN POSITION, THE HOPPER DRIVE SYSTEM WILL RATCHET THE GATE FORWARD, PUSHING THE BLANKS UNTIL THE LIMIT SWITCH IS MADE. THE (3) VACUUM CUPS OF THE VERTICAL CASE FEEDER WILL EXTEND TO CONTACT THE FIRST BLANK IN THE HOPPER.

4. THE VACUUM SYSTEM TURNS ON CAUSING THE CUPS TO SECURELY GRIP THE BLANK. THE VACUUM TROLLEY PULLS THE BLANK DOWNWARD INTO THE FORMING AREA.

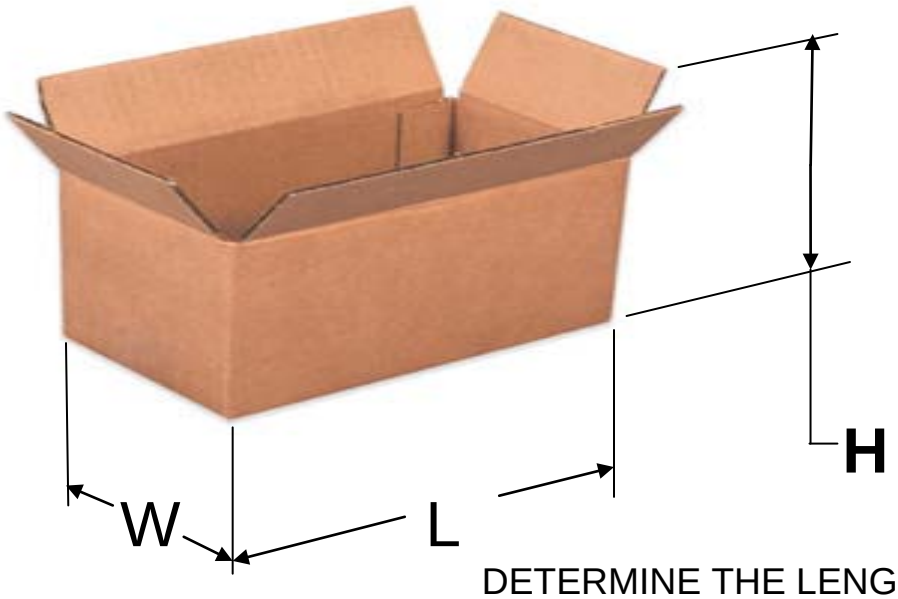
5. WHEN THE TROLLEY REACHES THE BOTTOM, VACUUM IS SWITCHED FROM THE 3^{RD} (OUTER) CUP TO THE CUP ON THE BOX-OPENING ARM. SIMULTANEOUSLY, THE ARM SWINGS IN TO GRIP THE MAJOR PANEL OF THE BOX. IMMEDIATELY, THE ARM REVERSES DIRECTION AND RETURNS TO THE HOME POSITION, CAUSING THE BOX TO OPEN.

6. AS THE BOX IS HELD OPEN BY VACUUM, THE MINOR FLAP FOLDERS SWING UP AND PUSH THE FLAPS UP. AFTER A SHORT TIME, VACUUM IS AUTOMATICALLY TURNED OFF AND THE BOX RESTS ON THE FLAP FOLDERS. THE VACUUM TROLLEY RISES TO THE HOME POSITION, READY TO EXTRACT THE NEXT BLANK.

7. THE BOX TRANSFER ARM PUSHES THE BOX FORWARD INTO THE LUG DRIVE SYSTEM. AS IT DOES THE MAJOR FLAPS COME IN CONTACT WITH THE FOLDING BARS CAUSING THE FLAPS TO FOLD UPWARD. ONCE THE BOX IS FULLY PUSHED INTO THE LUG DRIVE, THE TRANSFER ARM RETURNS TO ITS HOME POSITION AND THE MINOR FLAP FOLDERS RETRACT.

8. THE LUGS PICK UP THE BOX JUST IN FRONT OF THE IDLER SPROCKETS AND MOVE THE BOX THROUGH THE REMAINDER OF THE FOLDING BARS AND OVER THE TAPE CARTRIDGE. THE FINISHED BOX IS EJECTED ONTO EITHER THE STANDARD DEAD PLATE OR A CUSTOMER SUPPLIED CONVEYOR.

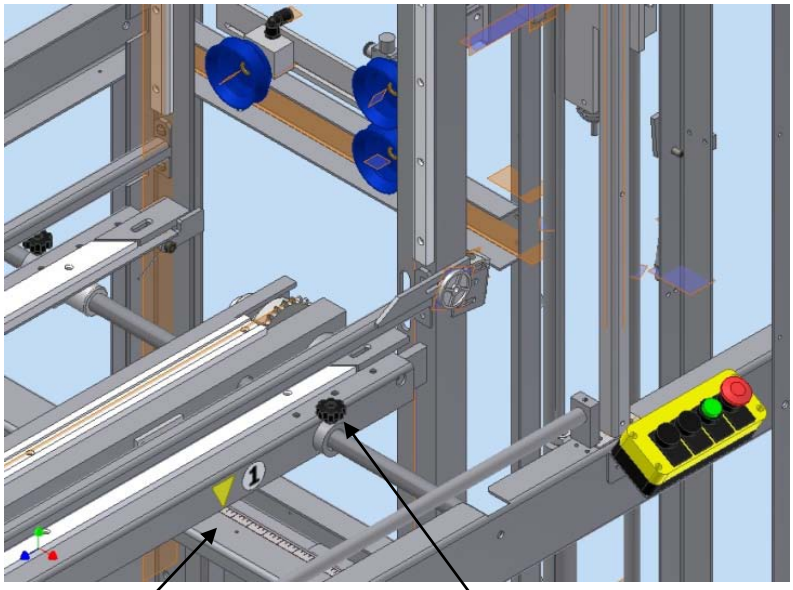
SET- UP INSTRUCTIONS



DETERMINE THE LENGTH, WIDTH AND HEIGHT (WITH FLAPS UP) OF BOX IN INCHES.

IMPORTANT: USE SCALES AND YELLOW POINTERS!

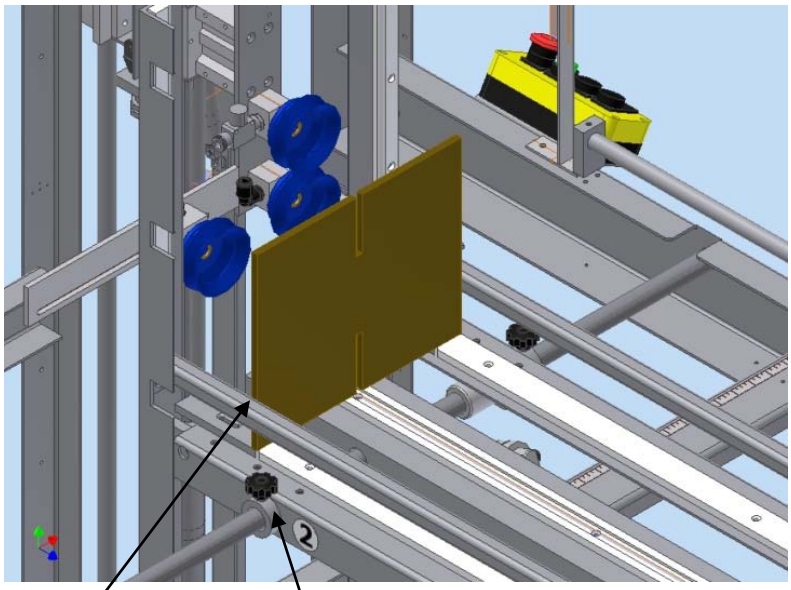
1) HOPPER, NEAR SIDE – SET EQUAL TO WIDTH.



SCALE AND POINTER **LOCK KNOB**

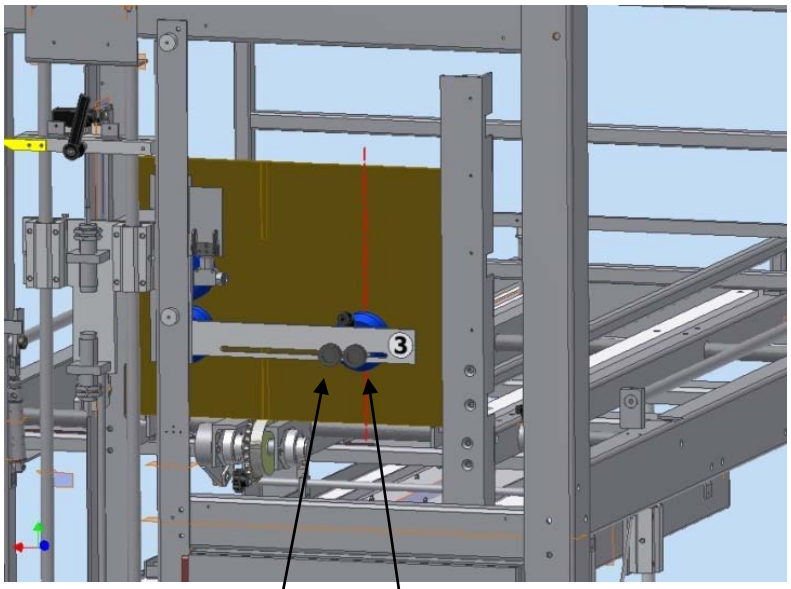
SET- UP INSTRUCTIONS

2) **HOPPER, FAR SIDE – USE THE BLANK (FLAT BOX) TO SET. LEAVE 1/4" EXTRA ROOM.**



¼" GAP **LOCK KNOB**

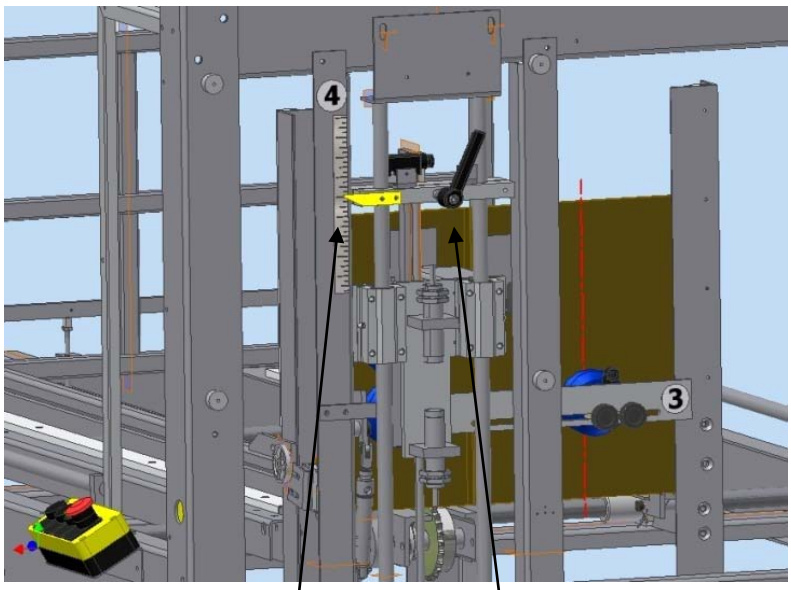
3) **ADJUST 3RD VACUUM CUP TO WIDEST POSITION POSSIBLE WITHOUT CUP HITTING VERTICAL BOX GUIDE. TIGHTEN LOCK KNOBS SECURELY.**



3RD CUP **LOCK KNOBS**

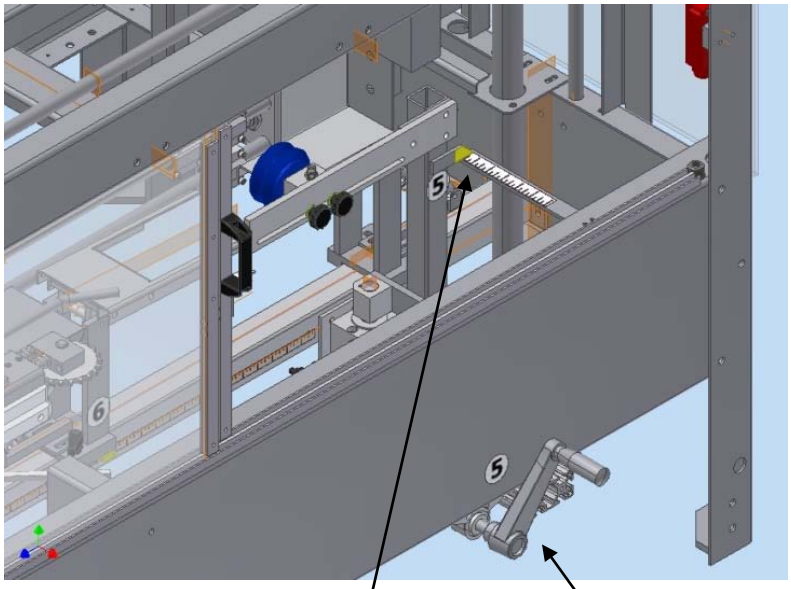
SET- UP INSTRUCTIONS

4) VERTICAL TROLLEY STOP – SET EQUAL TO WIDTH. TIGHTEN SECURELY.



POINTER AND SCALE **LOCK HANDLE**

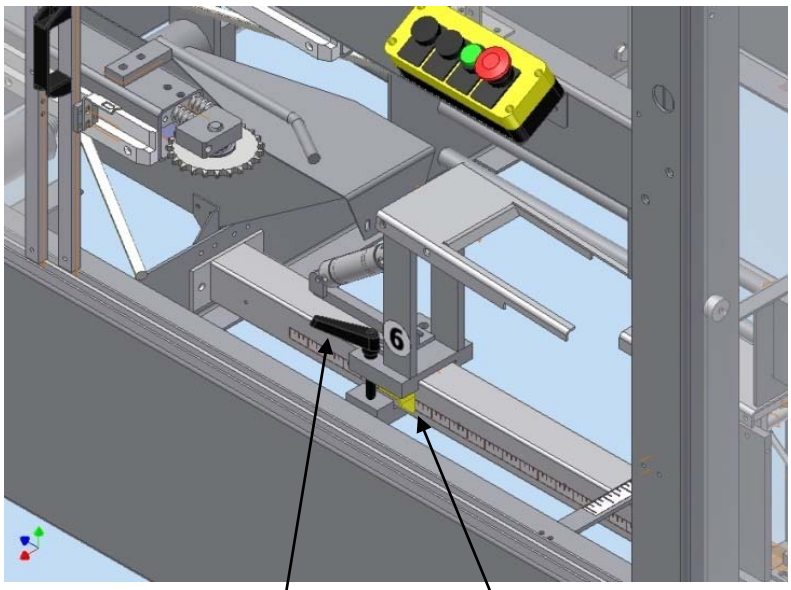
5) BOX OPENING ARM – SET EQUAL TO WIDTH (ARM IN OPEN POSITION). ADJUST VACUUM CUP TO LAND IN CENTER OF MAJOR PANEL.



SCALE **CRANK HANDLE**

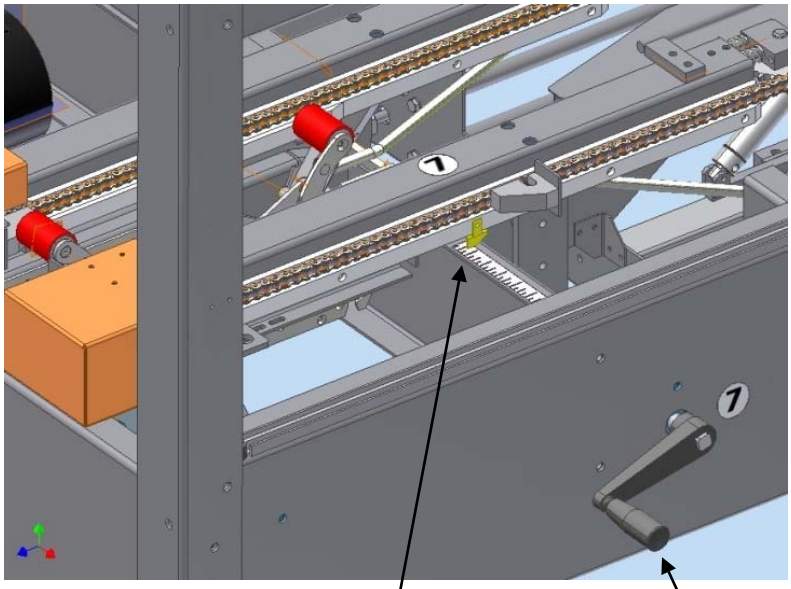
SET- UP INSTRUCTIONS

6) **FLAP FOLDER – SET TO LENGTH.**



LOCK HANDLE **POINTER AND SCALE**

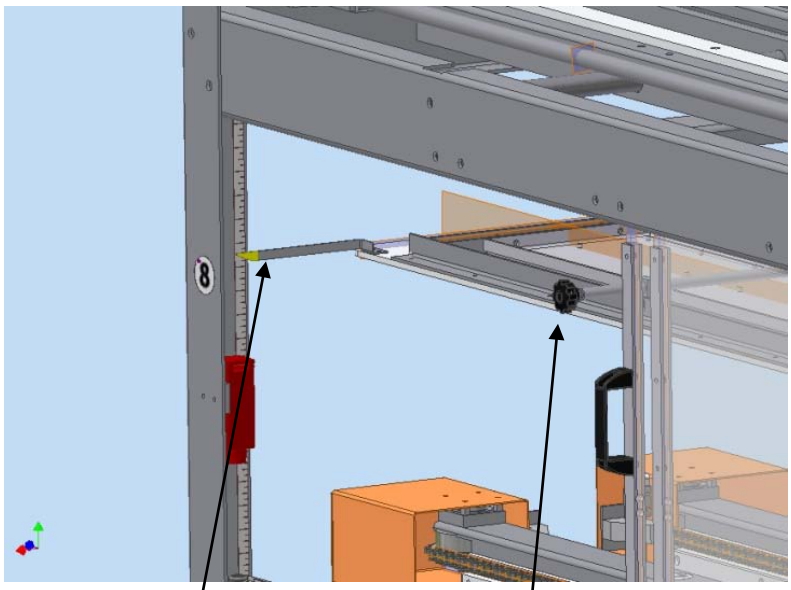
7) **LUG DRIVE – SET TO WIDTH.**



POINTER AND SCALE **CRANK HANDLE**

SET- UP INSTRUCTIONS

8) SLED HEIGHT – SET TO ERECTED BOX WITH TOP FLAPS UP.



POINTER AND SCALE **LOCK KNOB**

RUN ONE BOX IN STEP (MANUAL) MODE TO VERIFY SETTINGS

LOADING THE HOPPER

- MAKE SURE THE HOPPER IS CORRECTLY SET UP BASED ON THE OUTSIDE DIMENSIONS OF THE ERECTED BOX.
- THE BLANKS MUST BE LOADED WITH THE MAJOR PANEL TOWARD THE OPERATOR SIDE WHEN FACING THE VACUUM CUPS. ***IF THE BLANKS ARE NOT LOADED THIS WAY THE BOX WILL JAM IN THE FORMING SECTION.***
    - LIFT THE HOPPER GATE HANDLE AND PUSH IT ALL THE WAY BACK.
    - THE EASIEST WAY TO LOAD THE MACHINE IS TO PLACE FULL BUNDLES IN THE HOPPER WITHOUT REMOVING THE STRAPS. THE HOPPER WILL HOLD APPROXIMATELY 7 BUNDLES OF 25 BLANKS.
    - WHEN THE HOPPER IS FULLY LOADED, CUT ALL THE STRAPS OFF THE BUNDLES AND REMOVE THEM.
    - LIFT THE GATE HANDLE AND PUSH THE GATE FORWARD TO PROVIDE LIGHT PRESSURE ON THE BLANKS.
    - BLANKS SHOULD BE VERTICAL AND NOT LEANING IN ANY DIRECTION.

- THE HOPPER CAN BE RELOADED WITHOUT STOPPING THE MACHINE.
    - SUPPORT THE BLANKS WITH ONE HAND AND SLIDE THE GATE BACK WITH THE OTHER.
    - TAKE THE LAST 5 OR SO BLANKS IN THE HOPPER AND LEAN THEM TOWARD THE VACUUM CUPS TO SUPPORT THE REMAINING BLANKS.
    - LOAD FULL BUNDLES IN THE HOPPER

MACHINE START UP PROCEDURE

1. CLOSE ALL GUARD DOORS AND MAKE SURE ALL PERSONNEL ARE CLEAR FROM MACHINERY.

2. TURN ON MAIN AIR DISCONNECT AND ELECTRICAL POWER.

3. CHECK THAT HOPPER IS FILLED WITH BLANKS, AND THAT TAPE CARTRIDGE IS FILLED WITH TAPE.

4. CHECK THAT MACHINE HAS BEEN PROPERLY SET-UP TO RUN THE BLANKS THAT ARE LOADED IN HOPPER.

5. RE-SET THE EMERGENCY STOP PUSH BUTTON AND TURN SELECTOR SWITCH TO RUN POSITION.

6. DEPRESS MACHINE START PUSH BUTTON. MACHINE WILL BEGIN TO PROCESS BOXES.

7. WHILE IN RUN MODE THE MACHINE WILL CONTINUE TO MAKE BOXES UNLESS THE DOWNSTREAM PHOTO-EYE IS BLOCKED OR THE HOPPER EMPTIES.

MACHINE SHUT DOWN PROCEDURE

CONTROL STOP:

- TURN SELECTOR SWITCH TO TEST POSITION. WAIT UNTIL MACHINE FINISHES PROCESSING BOX.

- DEPRESS EMERGENCY STOP PUSH BUTTON.

EMERGENCY STOP:

- DEPRESS EMERGENCY STOP PUSH BUTTON.

- REMOVE ANY UNMADE OR JAMMED BOXES BEFORE RESTARTING MACHINE.

MAINTENANCE SCHEDULE

WARNING:

*NEVER.....*START THE MACHINE UNTIL ALL PERSONNEL ARE CLEAR.

*NEVER.....*LUBRICATE OR REPAIR THE MACHINE WHILE IT IS RUNNING.

*NEVER.....*PUT YOUR HANDS IN THE MACHINE WHILE IT IS RUNNING.

*NEVER.....*ALLOW ANY PART OF YOUR BODY TO COME IN CONTACT WITH MOVING PARTS OF THE MACHINE WHILE IT IS RUNNING.

TURN MACHINE OFF BEFORE PERFORMING ANY MAINTENANCE.

ELECTRICAL

CHECK MONTHLY:

1. INSPECT FOR LOOSE WIRES THROUGHOUT THE MACHINE AND INSIDE THE CONTROL PANEL.

2. INSPECT FOR MOISTURE INSIDE THE CONTROL PANEL.

3. CLEAN LENS ON ALL PHOTOCELLS.

PNEUMATIC

CHECK WEEKLY:

1. INSPECT AIR FILTER AND DRAIN.

2. INSPECT AND CLEAR THE VACUUM GENERATOR.

3. MAKE SURE FLOW CONTROLS ARE SET PROPERLY AND LOCKED.

4. INSPECT THE VACUUM CUPS FOR CRACKS OR TEARS. (IF A VACUUM CUP IS DAMAGED, VACUUM WILL BE REDUCED IN THE REMAINING CUPS.

5. MAKE SURE VACUUM LINES ARE FREE FROM DEBRIS.

6. MAKE SURE THE REGULATOR IS SET TO 80 PSI.

MAINTENANCE SCHEDULE CON'T.

PNUEMATIC

CHECK MONTHLY:

1. INSPECT THE COMPONENTS AND AIR LINES FOR LEAKS.

2. INSPECT AIR CYLINDERS FOR WEAR, DAMAGE OR EXCESSIVE NOISE.

MECHANICAL

CHECK WEEKLY:

1. MAKE SURE ALL NUTS AND BOLTS ON ARE TIGHT.

2. CHECK CHAIN TENSION ON MOTOR CHAIN AND LUG DRIVE.

   TO TIGHTEN THE MOTOR CHAIN:
   - REMOVE MOTOR GUARD
   - LOOSEN MOUNTING PLATE AND SLIDE MOTOR/REDUCER BACKWARD.
   - RE-TIGHTEN BOLTS.
   - RE-INSTALL GUARD.

   LUG CHAINS ARE AUTOMATICALLY TENSIONED BY SPRING LOADED IDLERS. IF EXCESSIVE SLACK IS PRESENT CHAINS SHOULD BE REPLACED ALONG WITH THE SPOCKETS.

3. CHECK ALL BEARINGS AND BUSHINGS FOR WEAR.

4. CHECK CHAIN LUGS FOR SQUARNESS. IF NECESSARY, ADJUST BY LOOSENING THE TRAN-TORQUE BUSHING UNDER THE LEFT DRIVE SPROCKET.

CHECK MONTHLY:

1. CHECK ALL SPROCKETS AND CHAINS FOR WEAR.

2. MAKE SURE THE SET SCREWS IN THE SPROCKETS ARE TIGHT.

3. CHECK SPROCKET AND CHAIN ALIGNMENT OF THE CHAIN-LUG SYSTEM.

NOTE: BOTH THE GEAR REDUCER AND THE RIGHT ANGLE GEAR BOXES ARE FILLED BY THE MANUFACTURER WITH PERMANENT LUBRICATION AND NO MAINTENANCE IS REQUIRED.

HOW TO ORDER SPARE PARTS

FOR GENERAL INFORMATION AND ORDERING PARTS CONTACT:
THE LOVESHAW CORPORATION
2206 EASTON TURNPIKE, BOX 83
SOUTH CANAAN, PA 18459

SERVICE DEPARTMENT: TEL: 1-800-747-1586

BEFORE YOU CONTACT LOVESHAW FOR PARTS OR SERVICE, KNOW THE MACHINE MODEL AND SERIAL NUMBER.

LOCATE LABEL ON THE OUTSIDE OF THE ELECTRICAL PANEL BOX. THE MACHINE MODEL AND SERIAL NUMBER WILL BE PRINTED ON IT.

WHEN CALLING LOVESHAW FOR PARTS:

A. GIVE THE MACHINE MODEL AND SERIAL NUMBER.

B. GIVE THE ASSEMBLY DESCRIPTION.
(I.E., SUCTION CUP ASSEMBLY)

C. GIVE PART NUMBER AND DESCRIPTION.
(I.E., VC-1001 SUCTION CUP)

BY FOLLOWING THE PROCEDURE ABOVE, YOU WILL ASSIST US IN SUPPLYING YOU WITH THE CORRECT PARTS FOR YOUR MACHINE AND ELIMINATE ANY MISUNDERSTANDING BETWEEN YOUR PURCHASING AGENT AND OUR PARTS DEPARTMENT.

TROUBLESHOOTING

PRELIMINARY CHECKS:

CHECK THAT ELECTRICAL OR AIR POWER HAS NOT BEEN DISCONNECTED. CHECK FOR LEAKING OR DISCONNECTED AIRLINES. CHECK ELECTRICAL FUSES FOR CONTINUITY.

USING TEST MODE TO TROUBLESHOOT MACHINE:

- CLOSE ALL GUARD DOORS AND MAKE SURE THE EMERGENCY STOP PUSH BUTTON IS NOT DEPRESSED.
- TURN THE SELECTOR SWITCH TO THE STEP POSITION AND DEPRESS THE MACHINE'S START PUSH BUTTON. THE MACHINE'S EMERGENCY STOP CIRCUIT WILL ENERGIZE, THE LUG DRIVE WILL START TO RUN AND THE MACHINE IS READY TO START A CYCLE.
- THE CASE ERECTOR CAN BE STEPPED THROUGH EACH MACHINE FUNCTION BY PUSHING THE STEP PUSH BUTTON.
- FOR EXAMPLE, WHEN THE MACHINE IS ORIGINALLY STARTED IN THE TEST MODE BY PUSHING THE STEP PUSH BUTTON, THE VERTICAL TROLLEY VACUUM CUP ASSEMBLY WILL EXTEND TOWARD THE HOPPER.
- BY CONTINUALLY PUSHING THE STEP BUTTON THE MACHINE WILL COMPLETELY STEP THROUGH AN ENTIRE MACHINE CYCLE (REFER TO MACHINE SEQUENCE OF OPERATION CHART).
- BY USING THE STEP MODE TO TROUBLESHOOT, IT CAN BE DETERMINED AT WHICH STEP THE MACHINE DOES NOT OPERATE. BY USING THIS METHOD YOU WILL ELIMINATE EXCESSIVE DOWN TIME.

CHECKING SOLENOID VALVES:

THE SOLENOID VALVES ARE EQUIPPED WITH MANUAL PUSHBUTTON OVERRIDES.

- WITH THE MACHINE IN THE TEST MODE, DEPRESS AND HOLD AN OVERRIDE BUTTON TO DETERMINE IF THE VALVE IS ABLE TO ACTUATE THE PNEUMATIC DEVICE THAT IT'S CONNECTED TO.
- ALSO CHECK THAT THE VALVE IS RECEIVING ELECTRICAL POWER. THERE ARE INDICATOR LIGHTS BUILT INTO THE COILS OF THE VALVES TO AIDE IN TROUBLE SHOOTING.

CHECKING PLC INPUTS AND OUTPUTS:

PROPERLY CHECKING INPUTS WILL REQUIRE TWO PEOPLE, ONE TO TRIGGER THE DEVICE, AND ONE TO MONITOR THE PLC. THE PLC HAS INDICATOR LIGHTS ON ITS FRONT PANEL FOR EACH INPUT AND OUTPUT. REFER TO THE ELECTRICAL SCHEMATICS FOR PLC/DEVICE INFORMATION.

CONTINUED NEXT PAGE:

TROUBLESHOOTING CONTINUED

CHECKING PLC INPUTS AND OUTPUTS CONTINUED:

- TO CHECK THE PLC INPUTS, THE MACHINE MUST BE “E” STOPPED. BY MANUALLY MOVING THE MACHINE COMPONENTS, THE VARIOUS SWITCHES CAN BE TRIGGERED ONE AT A TIME, AND THE CORRESPONDING PLC INPUT CAN BE VERIFIED.
- TO PROPERLY CHECK THE OUTPUTS, THE MACHINE MUST BE IN THE TEST MODE OF OPERATION. BY STEPPING THE MACHINE THROUGH ITS SEQUENCE OF OPERATION, THE PLC’S OUTPUTS CAN BE VERIFIED.

TAPE CARTRIDGE AND TAPING ISSUES:

REFER TO THE TAPE CARTRIDGE SECTION OF THIS MANUAL FOR ALL INFORMATION REFERRING TO TAPING OF THE ERECTED BOX.

MACHINE MALFUNCTIONS	POSSIBLE CAUSES
VERTICAL TROLLEY VACUUM CUPS WILL NOT EXTEND TOWARD HOPPER.	1. BOX BACKUP SENSOR PE1 BLOCKED. 2. LS1 NOT FUNCTIONING PROPERLY. 3. TROLLEY STOP IS LOOSE. 4. LOW TAPE ROLL DETECTED (OPTION). 5. LOW HOPPER DETECTED (OPTION). 6. CHECK PLC OUTPUTS 8 & 9. THEY SHOULD ***NOT BE*** LIT. 7. CHECK PLC INPUTS 1, 2, 6, 8, 10 & 11 AND OUTPUT 3. THEY SHOULD ***BE*** LIT. 8. CHECK SOL. 5.
VERTICAL TROLLEY VACUUM CUPS WILL NOT PICK BLANK FROM HOPPER.	1. CHECK PLC OUTPUT 7 (LIT). 2. CHECK SOL. 9. 3. CHECK VACUUM CUPS FOR DAMAGE. 4. CHECK VACUUM GENERATOR. 5. CHECK VACUUM HOSE(S).
VERTICAL TROLLEY WILL NOT LOWER TOWARD FORMING SECTION OF MACHINE.	1. CHECK PLC OUTPUT 4 (LIT). 2. CHECK SOL. 6. 3. CHECK AIR FLOW CONTROLS. 4. CHECK FOR MECH. BINDS OR JAMS.
BOX OPENING ARM DOES NOT SWING INWARD TOWARD BLANK .	1. CHECK PROX 3 ON BOTTOM OF VERTICAL CYLINDER (LIT). 2. CHECK PLC INPUT 4 (LIT).

TROUBLESHOOTING CONTINUED

	3. CHECK SOL. 2. 4. CHECK PLC OUTPUT 0 (LIT). 5. CHECK AIR FLOW CONTROLS.

	6. CHECK FOR MECH. BINDS OR JAMS.
BOX OPENING ARM VACUUM CUP WILL NOT GRIP THE BLANK.	1. CHECK PLC OUTPUT 6 & 7 (LIT). 2. CHECK SOL. 8 AND SOL.9. 3. CHECK VACUUM CUPS FOR DAMAGE. 4. CHECK VACUUM GENERATOR. 5. CHECK VACUUM HOSE(S). 6. CHECK PLC INPUT 7 (LIT). 7. CHECK PROX 6 ON ROTARY ACTUATOR (LIT).
BOX OPENING ARM DOES NOT RETURN TO OPEN POSITION (HOME POSITION).	1. CHECK PLC OUTPUT 0 (OFF). 2. CHECK SOL. 2. 3. CHECK AIR FLOW CONTROLS. 4. CHECK FOR MECH. BINDS OR JAMS.
MINOR FLAP FOLDERS DO NOT OPERATE.	1. CHECK PLC OUTPUT 2 (LIT). 2. CHECK SOL. 4. 3. CHECK PROX 5 (LIT). 4. CHECK PLC INPUT 6 (LIT). 5. CHECK FOR MECH. BINDS OR JAMS. 6. CHECK AIR FLOW CONTROLS.
VERTICAL TROLLEY WILL NOT RISE TOWARD THE HOPPER (HOME POSITION).	1. CHECK PROX 1 (REAR OF TRANSFER CYLINDER (LIT). 2. CHECK PLC INPUT 2 (LIT). 3. CHECK SOL. 6. 4. CHECK PLC OUTPUT 8 (OFF). 5. CHECK AIR FLOW CONTROLS. 6. CHECK FOR MECH. BINDS OR JAMS.
BOX TRANSFER ARM WILL NOT PUSH BOX INTO LUG DRIVE SYSTEM.	1. CHECK PROX 4 (APPROX. 6” FROM BASE OF VERT. CYL.) FOR MOMENTARY FLASH AS TROLLEY RISES. 2. CHECK PLC INPUT 5 (FLASH) AS TROLLEY RISES. 3. CHECK PLC OUTPUT 5 (LIT). 4. CHECK SOL. 7. 5. CHECK PHOTOEYE 2 (LUG DETECT). 6. CHECK PLC INPUT 14 (FLASH).
MACHINE SHUTS OFF ON ITS OWN.	1. CHECK THAT SAFETY GATES ARE SECURELY CLOSED. 2. CHECK PLC INPUT 10 (LIT).

TROUBLESHOOTING CONTINUED

	3. CHECK MOTOR OVER-CURRENT RELAY. 4. CHECK FOR MECHANICAL PROBLEM

	IN LUG DRIVE SYSTEM.
BLANKS JAM WHILE BEING STRIPPED FROM HOPPER.	1. CHECK PRESSURE ON FRONT BLANK. IF TOO TIGHT: • ADJUST LS1 TOWARD BLANKS. • SLOW THE RATCHETING ACTION OF THE HOPPER CYLINDER BY THROTTLING THE FLOW CONTROLS. IF TOO LOOSE: • ADJUST LS1 AWAY FROM BLANKS. 2. SET THE GAP OF THE STRIPPER PLATES (1.5 X THE THICKNESS OF BLANK). 3. CHECK HOPPER GUIDE CLEARANCE (1/4”).
BOX NOT SQUARE AFTER TAPING	1. MAKE SURE CHAIN LUGS ARE SQUARE TO EACH OTHER. SEE MECHANICAL SECTION FOR ADJUSTMENT.
MAJOR FLAPS (BOTTOM) NOT STRAIGHT OR OVERLAPPED	1. ADJUST MAIN DRIVES IN 1/8” INCREMENTS.
BOX DEFORMED BY LUGS (BACK PANEL PUSHED IN) OR SQUEEZERS (SIDES OF BOX HAVE SCORE LINES).	1. OPEN MAIN DRIVE IN 1/8” INCREMENTS. 2. RAISE SLED IN 1/8” INCREMENTS.
BOX DOES NOT OPEN OR TRANSITION INTO LUG DRIVE SMOOTHLY	1. CHECK TROLLEY STOP SETTING. 2. CHECK TOP SLED SETTING. 3. CHECK BOX OPENING ARM SETTING.

Little David® Warranty

For: CASE FORMER MODELS
CF25-T, CF50-T, CF40T-XL MODELS

1 YEAR WARRANTY ON DRIVE MOTOR
1 YEAR WARRANTY ON GEAR REDUCER
3 YEAR WARRANTY ON TAPE CARTRIDGE (EXCEPT FOR MOVING PARTS THAT ARE SUBJECT TO NORMAL WEAR, TEAR AND REPLACEMENT, WHICH ARE WARRANTED ONLY TO BE FREE FROM DEFECTS IN MATERIAL AND WORKMANSHIP.)
1 YEAR ON PLC
1 YEAR ALL OTHER PARTS (EXCEPT FOR WEAR AND MOVING PARTS.)

For: CASE FORMER MODEL
CF5

1 YEAR ON PLC
1 YEAR ALL OTHER PARTS (EXCEPT FOR WEAR AND MOVING PARTS.)

*LIMITED WARRANTY – ***LOVESHAW,*** AN ***ITW*** COMPANY (HEREIN AFTER "***LOVESHAW***") WARRANTS ONLY THAT THE GOODS SOLD BY IT SHALL BE FREE FROM DEFECTS IN MATERIAL AND WORKMANSHIP, UNDER PROPER AND NORMAL USE AND MAINTENANCE, AS FOLLOWS:

DRIVE MOTOR -	1 YEAR	
GEAR REDUCER - 1 YEAR		
TAPE CARTRIDGE -	3 YEARS	(EXCEPT FOR MOVING PARTS THAT ARE SUBJECT TO NORMAL WEAR, TEAR, AND REPLACEMENT, WHICH ARE WARRANTED ONLY TO BE FREE FROM DEFECTS IN MATERIAL AND WORKMANSHIP.)
PLC -	1 YEAR	
ALL OTHER PARTS -	1 YEAR	(EXCEPT FOR MOVING PARTS THAT ARE SUBJECT TO NORMAL WEAR, TEAR AND REPLACEMENT, WHICH ARE WARRANTED ONLY TO BE FREE FROM DEFECTS IN MATERIAL AND WORKMANSHIP.)

THE WARRANTY PERIOD SHALL COMMENCE AS OF THE DATE OF DELIVERY TO THE PURCHASER. THE OBLIGATION OF LOVESHAW UNDER THIS WARRANTY IS STRICTLY LIMITED TO THE COST OF REPAIRING OR REPLACING, AS LOVESHAW MAY ELECT, ANY PART OR PARTS THAT PROVE IN LOVESHAW'S JUDGMENT TO HAVE BEEN DEFECTIVE IN MATERIAL OR WORKMANSHIP AT THE TIME THE GOODS WERE SHIPPED FROM LOVESHAW'S PLANT. ANY WARRANTY CLAIM NOT MADE IN WRITING TO LOVESHAW AT ITS HOME OFFICE WITHIN THE APPLICABLE WARRANTY PERIOD AND WITHIN 10 DAYS OF FAILURE WILL NOT BE VALID. THIS IS THE SOLE AND EXCLUSIVE REMEDY AVAILABLE UNDER THIS WARRANTY. UNDER NO CIRCUMSTANCES WILL LOVESHAW BE LIABLE FOR INCIDENTAL, SPECIAL OR CONSEQUENTIAL DAMAGES.

IF REQUESTED BY LOVESHAW, PURCHASER SHALL RETURN ANY DEFECTIVE PART OR PARTS TO LOVESHAW'S PLANT, FREIGHT PREPAID. ALL WARRANTY PART REPLACEMENTS AND REPAIRS MUST BE MADE BY LOVESHAW OR A LOVESHAW AUTHORIZED TO HANDLE THE GOODS COVERED BY THIS WARRANTY. ANY OUTSIDE WORK OR ALTERATIONS DONE WITHOUT LOVESHAW'S PRIOR WRITTEN APPROVAL WILL RENDER THIS WARRANTY VOID. ***LOVESHAW,*** AN ***ITW*** COMPANY WILL NOT ASSUME ANY EXPENSE OR LIABILITY FOR ANY REPAIRS MADE TO ITS GOODS OUTSIDE ITS WORKS WITHOUT ITS PRIOR WRITTEN CONSENT. THIS WARRANTY SHALL NOT APPLY TO ANY ITEM THAT HAS NOT BEEN USED, OPERATED, AND MAINTAINED IN ACCORDANCE WITH LOVESHAW'S RECOMMENDED PROCEDURES LOVESHAW SHALL HAVE NO LIABILITY WHATSOEVER WHERE THE GOODS HAVE BEEN ALTERED, MISUSED, ABUSED OR INVOLVED IN AN ACCIDENT.

NO PERSON IS AUTHORIZED TO MAKE ANY WARRANTY OR TO CREATE ANY LIABILITY BINDING UPON LOVESHAW. WHICH IS NOT STATED IN THIS WARRANTY. THIS WARRANTY IS EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES OF ANY KIND, EXPRESSED OR IMPLIED, WHICH ARE HEREBY EXCLUDED. IN PARTICULAR, THE IMPLIED WARRANTY OF MERCHANTABILITY, AS WELL AS THE IMPLIED WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE ARE HEREBY EXCLUDED.

LOVESHAW AN ITW COMPANY
2206 EASTON TURNPIKE, BOX 83 SOUTH CANAAN, PA 18459
TEL: 570.937.4921 - 800.572.3434 - FAX: 570.937.3229

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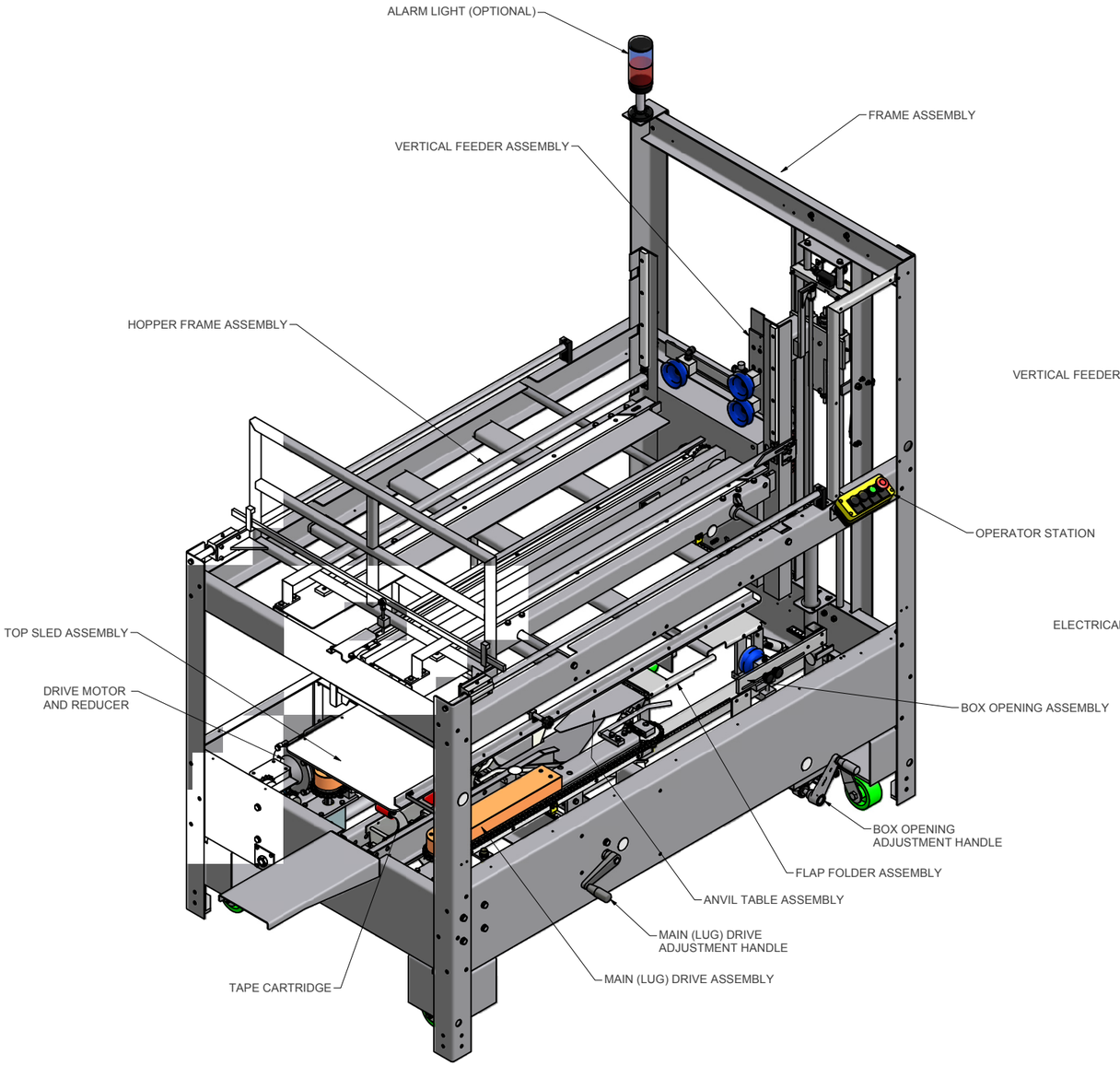
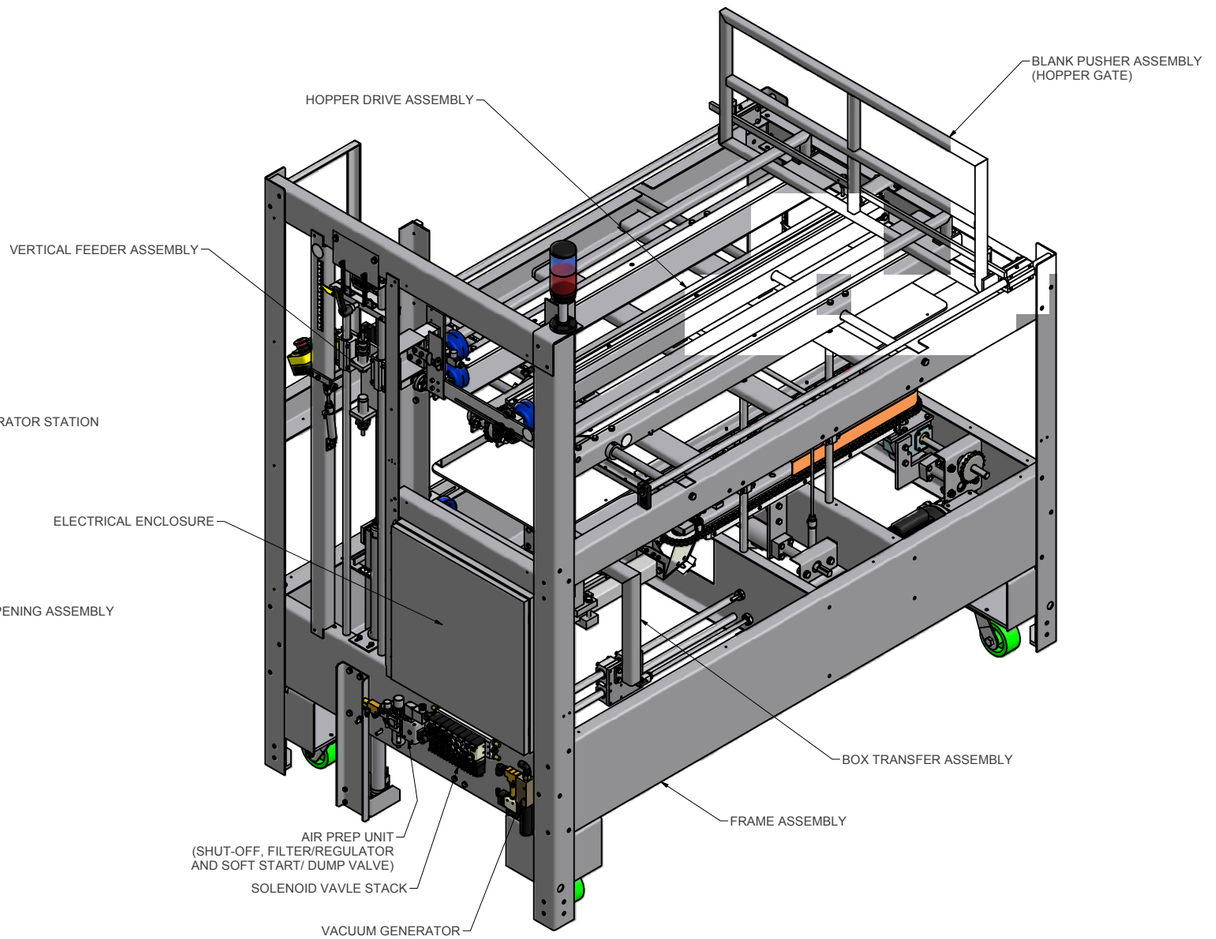


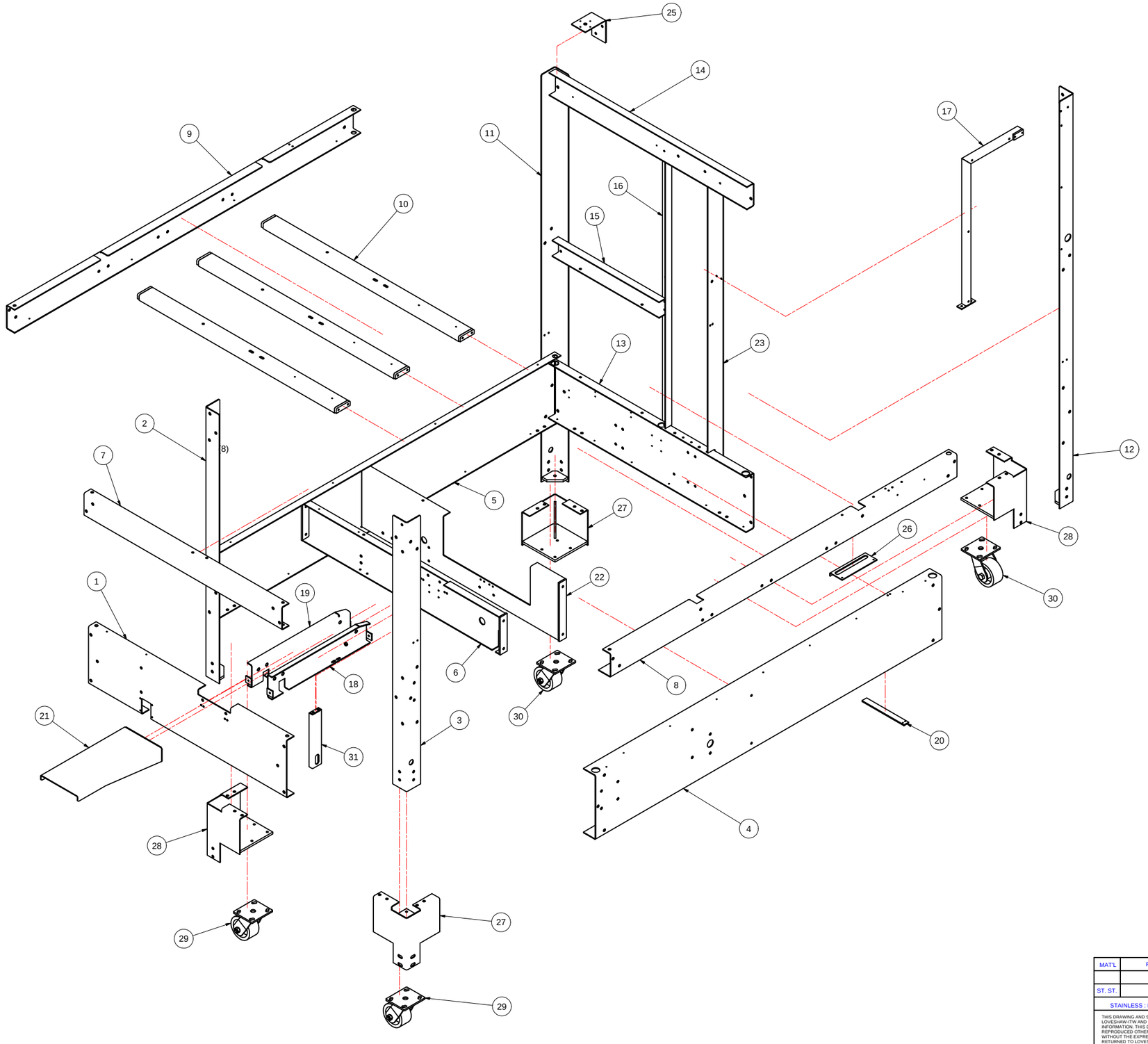


GUARDING OMITTED TO
SHOW INTERNAL ASSEMBLIES

MAT'L	PART #	CAD FILE .CF25T.idw	TOLERANCES UNLESS OTHERWISE NOTED:	LOVESHAW an ITW Company RT. 296, SOUTH CANAAN, PA.
	STD	PLOT DATE 4/12/2010		
ST. ST.		DRAWN DATE 3/1/2010	.X =±.050 INCH .XX =±.015 .XXX =±.005 ANGLES ±1/2°	TITLE: MACHINE OVERVIEW, CF25-T
STAINLESS : NO FINISH		DO NOT SCALE PRINT	.X =±1.0mm METRIC .XX =±.3mm .XXX =±.1mm MACH. FINISH	DWG NO .CF25T / SCALE
THIS DRAWING AND SUBJECT MATTER THEREON IS THE EXCLUSIVE PROPERTY OF LOVESHAW-ITW AND IS TO BE TREATED BY YOU AS CONFIDENTIAL PROPRIETARY INFORMATION. THIS DRAWING OR SUBJECT MATTER THEROF SHALL NOT BE REPRODUCED OTHER THAN FOR YOUR OWN USE OR TO BE DISCLOSED TO OTHER WITHOUT THE EXPRESSED WRITTEN CONSENT OF LOVESHAW-ITW AND WILL BE RETURNED TO LOVESHAW-ITW UPON REQUEST.			FRACTIONS ± 1/64	MATERIAL / CHECKED
				DRAWN richm / APPROVED

richm

REVISION HISTORY			
REV	DESCRIPTION	DATE	BY
A	RELEASED	9/24/2007	RM



(8)

Parts List			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	CF20-0317-6	FRAME, REAR
2	1	CF20-0318-6	UPRIGHT REAR, RIGHT
3	1	CF20-0319-6	UPRIGHT, REAR LEFT
4	1	CF20-0320-6	FRAME, SIDE LEFT
5	1	CF20-0321-6	FRAME, SIDE RIGHT
6	1	CF20-0322-6	CENTER CHANNEL
7	1	CF20-0324-6	BRACE, TOP REAR
8	1	CF20-0325-6	BRACE, TOP SIDE LEFT
9	1	CF20-0326-6	BRACE, TOP SIDE RIGHT
10	3	CF20-0327-6	BRACE - CENTER (HOPPER)
11	1	CF20-0328-6	UPRIGHT FRONT, RIGHT
12	1	CF20-0330-6	UPRIGHT, FRONT LEFT
13	1	CF20-0331-6	FRONT FRAME
14	1	CF20-0332-6	BRACE, TOP FRONT
15	1	CF20-0336-5	MIDDLE BRACE
16	1	CF20-0338-5	GUARD MOUNT
17	1	CF20-0341-5	GUARD MOUNT
18	1	CF20-0428L-5	SIDE PLATE, LEFT, TAPE CARTRIDGE
19	1	CF20-0428R-5	SIDE PLATE, RIGHT, TAPE CARTRIDGE
20	1	CF20-0430-3	SCALE, BOX OPENING
21	1	CF20-0435-5	EXTENSION, DISCHARGE
22	1	CF20-0512-6	CHANNEL, CENTER
23	1	CF20-0537-5	MOUNTING POST, TROLLEY STOP
			*** PARTS BELOW ARE OPTIONAL ***
25	1	CF20-0553-4	BRACKET, STACK LIGHT
26	1	CF20-0554-4	BRACKET, PROX, LOW HOPPER
27	2	CF20-0556L-5	BRACKET, CASTER, L.H.
28	2	CF20-0556R-5	BRACKET, CASTER, R.H.
29	2	201763	CASTER, SWIVEL
30	2	201763/R	CASTER, RIGID
31	1	C622910	BRACKET, LOW TAPE ALARM

MAT'L	PART #	CAD FILE .FRACF20-D.idw	TOLERANCES UNLESS OTHERWISE NOTED:
	STD	PLOT DATE 2/1/2010	
ST. ST.		DRAWN DATE 9/24/2007	
STAINLESS : NO FINISH		DO NOT SCALE PRINT	

.X =±.050
INCH .XX =±.015 ANGLES ±1/2°
.XXX =±.005

.X =±1.0mm
METRIC .XX =±.3mm MACH. FINISH
.XXX =±.1mm

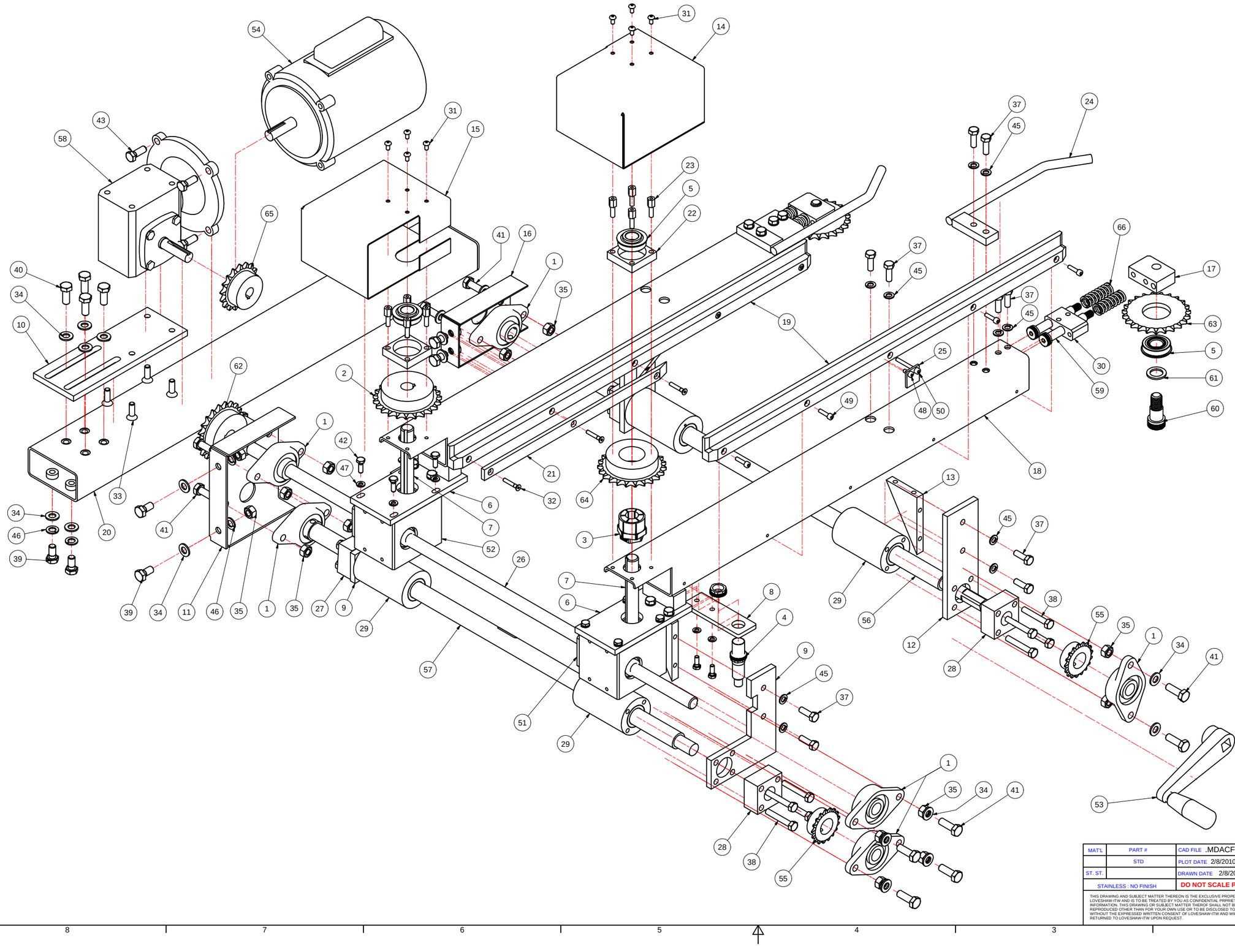
FRACTIONS ±1/64

LOVESHAW an ITW Company
RT. 296, SOUTH CANAAN, PA.

TITLE
FRAME ASSY CF25-T

DWG NO .FRACF25-D	SCALE
MATERIAL	CHECKED
DRAWN richm	APPROVED

REVISION HISTORY			
REV	DESCRIPTION	DATE	BY
A	RELEASED	2/8/2010	RM



Parts List			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	6	200844	FLANGE BEARING, 2-BOLT, 3/4"
2	1	203174-12	SPROCKET
3	1	204355	BUSHING, KEYLESS
4	1	A219-BAN-8	LUG PHOTOEYE
5	4	BRG-2004	BALL BEARING
6	2	CF20-0482-4	MOUNTING PLATE, GEARBOX
7	2	CF20-0483-4	VERTICAL SHAFT
8	1	CF20-0484-4	BRACKET, LUG PHOTOEYE
9	2	CF20-0486-4	BRACKET, DRIVE SUPPORT, FRONT
10	1	CF20-0487-4	BASE, REDUCER
11	1	CF20-0490-5	BEARING BRACKET, HORIZONTAL SHAFTS
12	2	CF20-0491-4	BRACKET, DRIVE SUPPORT, REAR
13	4	CF20-0492-3	BRACKET, DRIVE SUPPORT
14	1	CF20-0493L-5	GUARD, LUG DRIVE, LEFT
15	1	CF20-0493R-5	GUARD, LUG DRIVE, RIGHT
16	1	CF20-0494-4	BRACKET, LEADSCREW BEARING
17	2	CF20-0495-3	BLOCK, IDLER
18	2	CF20-0496-6	MAIN TUBE, LUG DRIVE
19	4	CF20-0497-5	GUIDE STRIP, LUG CHAIN
20	1	CF20-0501-4	BEAM, MOTOR SUPPORT
21	2	CF20-0506-4	STRIP, SQUEEZER
22	2	CF20-0507-4	PLATE, BEARING
23	8	CF20-0508-3	STANDOFF, CHAIN GUARD
24	2	CF20-0530-4	BOX GUIDE, LUG DRIVES
25	1	CF20-0551-3	POINTER
26	1	CF50-0122-4	DRIVE SHAFT-HORIZONTAL
27	2	CF50-0135L-4	NUT PLATE, LH THRD
28	2	CF50-0135R-4	NUT PLATE, RH THRD
29	4	CF50-0250-4	BEARING ASSEMBLY
30	2	CF50-0283-3	BLOCK, ANCHOR
31	8	FBHMF010P10	BHCS M5 X 10 LG.
32	6	FFHMF030P10	FHCS M5 X 30 LG.
33	4	FFHSH100S05	FHCS 5/16-18 X 1.00
34	18	FFWMIP	FLAT WASHER M10
35	16	FHFNMIP	HEX NUT M10
36	2	FHHMG016P10	HHCS M6 X 16
37	24	FHHMH025P10	HHCS M8 X 25
38	16	FHHMH050S10	HHCS M8 X 50
39	8	FHHMI020P88	HHCS M10 X 20
40	8	FHHMI025P88	HHCS M10 X 25
41	12	FHHMI030P88	HHCS M10 X 30 LG.
42	8	FHHSE075P08	HHCS 1/4-20 x 3/4 LG
43	4	FHHSJ100P08	HHCS 3/8-16 x 1 LG
44	2	FLWMGP	LOCK WASHER M6
45	24	FLWMHP	LOCK WASHER M8
46	12	FLWMIP	LOCK WASHER M10
47	8	FLWSDP	LOCK WASHER 1/4
48	1	FSHMF012P10	SHCS M5 X 12 LG.
49	13	FSHMF020P10	SHCS M5 X 20 LG.
50	1	FSHMF040P10	SHCS M5 x 40 LG.
51	1	GB-1000L	GEAR BOX, LH
52	1	GB-1000R	GEAR BOX, RH
53	1	HC-1023	CRANK HANDLE
54	1	LD16B-2033A	MOTOR, 1/3 HP
55	2	LD3SB2-2026	SPROCKET
56	1	PFF-0034-6	LEAD SCREW, HANDLE
57	1	PFF-0056-6	LEAD SCREW, IDLER
58	1	RED-1001L	REDUCER, 20:1
59	4	SPH-1359	SHOULDER BOLT, 1/2" X 3" LG.
60	2	SPH-1401	SHOULDER BOLT, 3/4 X 3/4
61	3	SPH-1402	SHIM
62	1	SPK-0120	SPROCKET
63	2	SPK-0121	SPROCKET, IDLER
64	1	SPK-0122	SPROCKET
65	1	SPK-0127	SPROCKET
66	4	SPR-1052	SPRING, COMPRESSION

MAT'L	PART #	CAD FILE .MDACF20.idw	
	STD	PLOT DATE 2/8/2010	
ST. ST.		DRAWN DATE 2/8/2010	
STAINLESS : NO FINISH		DO NOT SCALE PRINT	

TOLERANCES UNLESS OTHERWISE NOTED:
.X =±.050
INCH .XX =±.015 ANGLES ±1/2°
.XXX =±.005
.X =±1.0mm
METRIC .XX =±.3mm MACH. FINISH
.XXX =±.1mm
FRACTIONS ±1/64

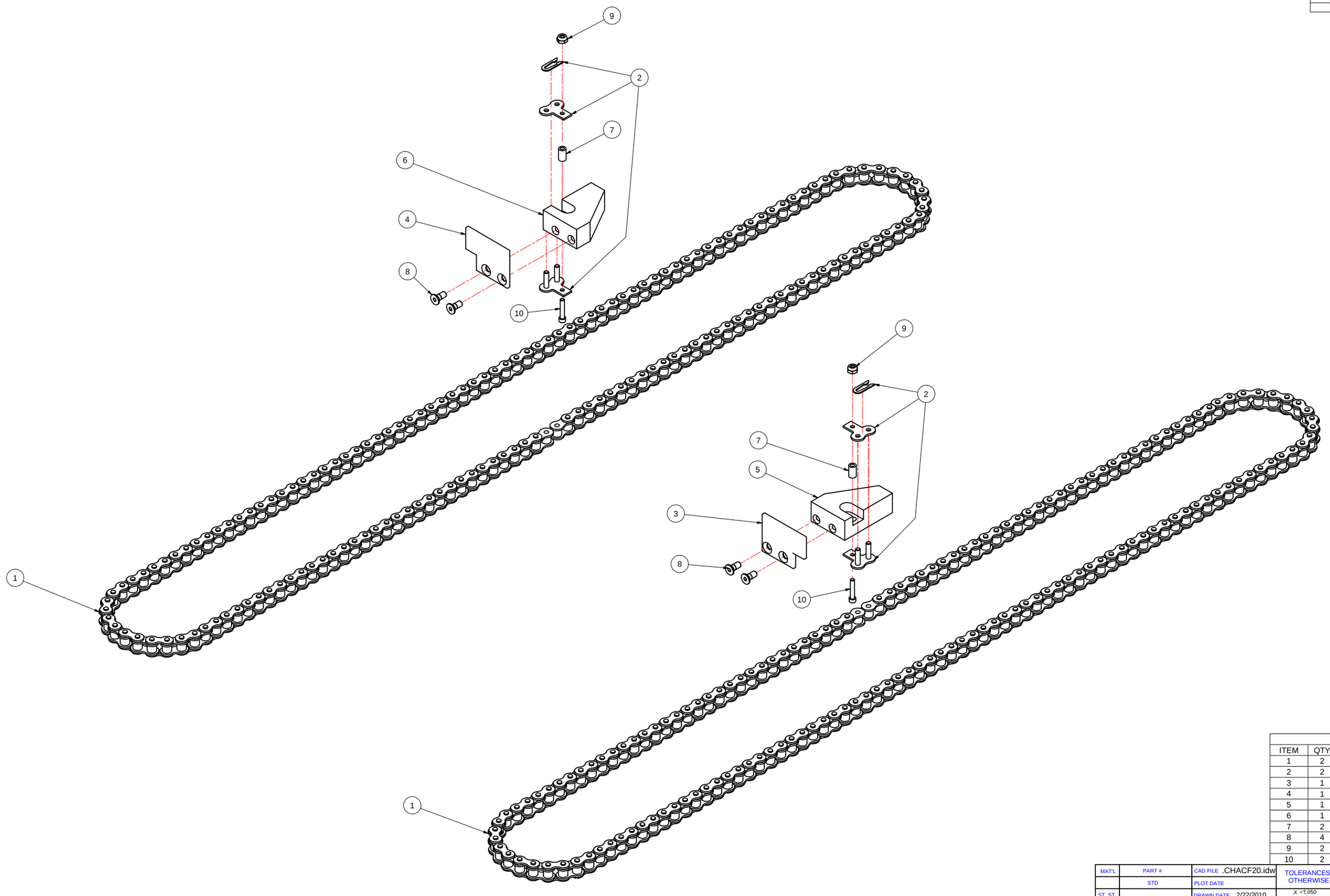
LOVESHAW an *ITW* Company
RT. 296, SOUTH CANAAN, PA.

TITLE
MAIN DRIVE ASSEMBLY

DWG NO .MDACF20	SCALE
MATERIAL	CHECKED
DRAWN richm	APPROVED

richm

REVISION HISTORY			
REV	DESCRIPTION	DATE	BY
A	RELEASED	2/22/2010	RM

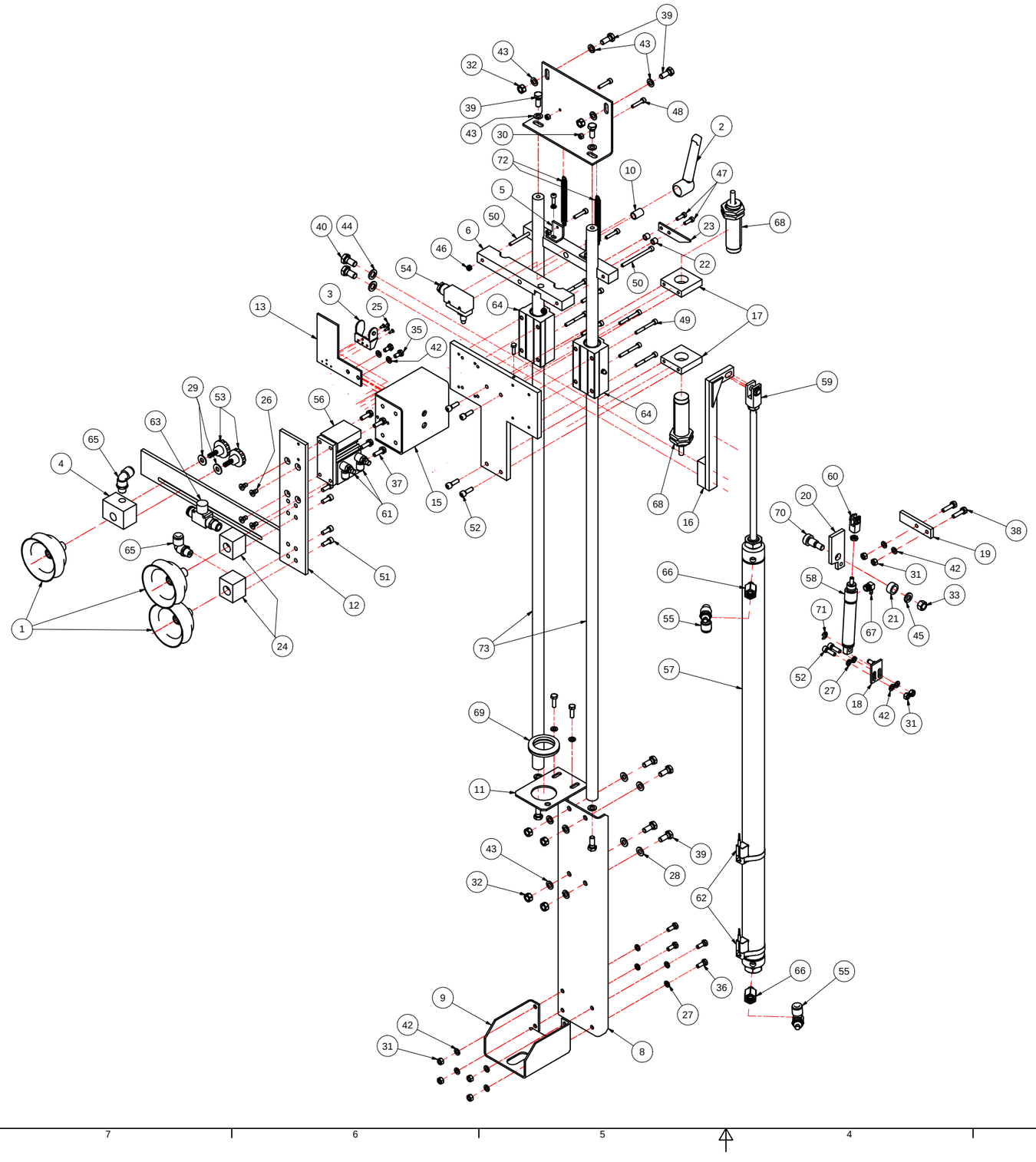


Parts List			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	2	201765-P	#40 ROLLER CHAIN, 78"
2	2	204143	CHAIN LINK, ATTACHMENT
3	1	CF20-0555L-3	LUG PLATE, LEFT
4	1	CF20-0555R-3	LUG PLATE, RIGHT
5	1	CF50-0100L-3	PUSHER LUG, LH
6	1	CF50-0100R-3	PUSHER LUG, RH
7	2	CF50-0102-3	CHAIN SPACER
8	4	FFHMF012P10	FHCS M5 X 12
9	2	FNLNSAP	6-32 NC Nylock Nut
10	2	FSHSA075B08	SHCS, 6-32 X 0.75

MAT'L	PART #	CAD FILE .CHACF20.idw	TOLERANCES UNLESS OTHERWISE NOTED:	LOVESHAW an ITW Company RT. 296, SOUTH CANAAN, PA.
	STD	PLOT DATE		
ST. ST.		DRAWN DATE 2/22/2010	.X =±.050 INCH .XX =±.015 .XXX =±.005 ANGLES ±1/2°	TITLE LUG CHAIN ASSEMBLY, CF20-T
STAINLESS : NO FINISH		DO NOT SCALE PRINT	.X =±1.0mm METRIC .XX =±.3mm .XXX =±.1mm MACH. FINISH	DWG NO .CHACF20 / SCALE
			FRACTIONS ±1/64	MATERIAL / CHECKED
				DRAWN richm / APPROVED

richm

REVISION HISTORY			
REV	DESCRIPTION	DATE	BY
A	RELEASED	2/12/2010	RM



Parts List			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	3	.VC-1001	VACUUM CUP
2	1	202669	RATCHET HANDLE
3	1	CC-0002	BRACKET, ENERGY CHAIN
NS	6 FT.	CC-0001	ENERGY CHAIN
4	1	CF20-0105-4	SUCTION CUP BLOCK
5	2	CF20-0123-3	PANEL BRACKET
6	1	CF20-0371-4	CLAMP, VERTICAL FEEDER
7	1	CF20-0372-4	MOUNT, VERTICLE SHAFTS
8	1	CF20-0424-4	BRACKET, VERTICAL CYLINDER
9	1	CF20-0425-5	BRACKET, CYLINDER
10	1	CF20-0472-3	SPACER, VERTICLE CLAMP
11	1	CF20-0477-4	BRACE, CYLINDER
12	1	CF20-0480-5	CUP BASE, 3 CUPS
13	1	CF20-0524-3	BRACKET, ENERGY CHAIN
14	1	CF20-0525-4	BEARING PLATE, VERTICAL FEEDER
15	1	CF20-0526-4	BRACKET, PICK CYLINDER
16	1	CF20-0527-4	ARM, VERTICAL CYLINDER
17	2	CF20-0529-3	BLOCK, SHOCK MOUNT
18	1	CF20-0533-4	PIVOT BRACKET, TROLLEY STOP CYLINDER
19	1	CF20-0534-3	HARD STOP, DOG
20	1	CF20-0535-3	DOG, TROLLEY STOP
21	1	CF20-0536-3	SPACER, DOG
22	2	CF20-0540-3	SPACER, POINTER
23	1	CF20-0541-3	POINTER, VERTICAL STOP
24	2	CF20-0543-4	BLOCK, SUCTION CUP
25	4	FFHMD008P10	FHCS M3 X 10
26	4	FFHMG012P10	FHCS M6 X 12
27	8	FFWMGP	FLAT WASHER M6
28	4	FFWMHP	FLAT WASHER M8
29	2	FFWSDP	FLAT WASHER 1/4
30	4	FHFNMFP	HEX NUT M5
31	8	FHFNMGP	HEX NUT M6
32	6	FHFNMHP	HEX NUT M8
33	1	FHFNSJP	HEX NUT 3/8-16
34	1	FHHMF016P10	HHCS M5 x 16
35	2	FHHMG012P10	HHCS M6 X 12
36	8	FHHMG016P10	HHCS M6 X 16
37	6	FHHMG020P10	HHCS M6 X 20
38	2	FHHMG025P10	HHCS M6 X 25
39	10	FHHMH020P10	HHCS M8 X 20
40	2	FHHMI020P88	HHCS M10 X 20
41	2	FLWMFP	LOCK WASHER M5
42	20	FLWMGP	LOCK WASHER M6
43	12	FLWMHP	LOCK WASHER M8
44	2	FLWMIP	LOCK WASHER M10
45	1	FLWSFP	LOCK WASHER 3/8
46	2	FNLNMFS	M5 NYLON LOCKING NUT
47	4	FSHMF016P10	SHCS M5 X 16
48	4	FSHMF025B10	SHCS M5 X 25
49	8	FSHMF045P10	SHCS M5 X 45
50	2	FSHMF070P10	SHCS M5 X 70
51	4	FSHMG016P10	SHCS M6 X 16
52	6	FSHMG020P10	SHCS M6 X 20
53	2	HC-1046	HAND KNOB
54	1	LDF506	LIMIT SWITCH ASSY
55	2	N400-220	FLOW CONTROL, 1/4 NPT X 3/8 TUBE
56	1	N401-228	GUIDED CYLINDER
57	1	N401-323	CYLINDER, VERTICLE FEEDER
58	1	N401-334	CYLINDER, TROLLEY STOP
59	1	N471	ROD CLEVIS
60	1	N524	CLEVIS, CYLINDER
61	2	N590	FLOW CONTROL, 1/8 NPT X 1/4 TUBE
62	2	N617	REED SWITCH
63	1	N642	HAND VALVE
64	2	PB20-SB-2	BEARING, PILLOW BLOCK
65	2	PF-18	ELBOW, 1/4NPT X 3/8 PUSHLOC
66	2	PF-27	PIPE ADAPTER, 1/4 X 1/8
67	1	PSR636	ELBOW, ADAPTER, 1/8 NPT X 1/4 TUBE
68	2	SHK-007	SHOCK ABSORBER
69	1	SPH-1280	GROMMET, RUBBER
70	1	SPH-1415	SHOULDER BOLT, 1/2" DIA X 5/8" LG.
71	1	SPH-1417	E-CLIP, 1/4"
72	2	SPR-1059	EXTENSION SPRING
73	2	TS20-22-1200-4	LINEAR SHAFT, VERTICAL

MAT'L	PART #	CAD FILE .VFACF20-D.idw	TOLERANCES UNLESS OTHERWISE NOTED:
	STD	PLOT DATE	
ST. ST.		DRAWN DATE 2/12/2010	.X =±.050 INCH .XX =±.015 .XXX =±.005 ANGLES ±1/2°
STAINLESS : NO FINISH		DO NOT SCALE PRINT	.X =±1.0mm METRIC .XX =±.3mm .XXX =±.1mm MACH. FINISH √
			FRACTIONS ±1/64

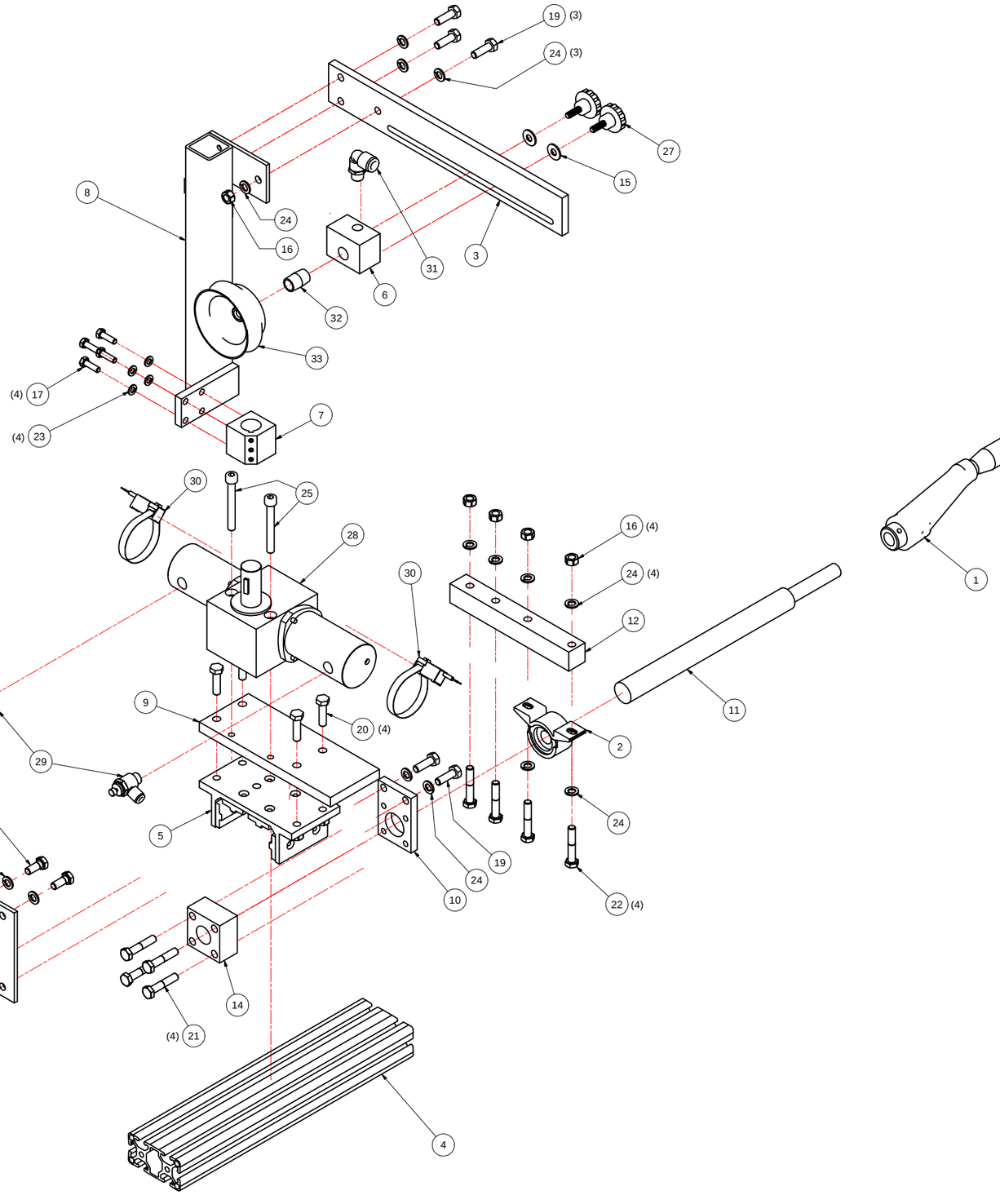
LOVESHAW an ITW Company
RT. 296, SOUTH CANAAN, PA.

TITLE: VERTICLE FEEDER ASSEMBLY

DWG NO .VFACF20-D	SCALE
MATERIAL	CHECKED
DRAWN richm	APPROVED

richm

REVISION HISTORY			
REV	DESCRIPTION	DATE	BY
A	RELEASED	2/23/2010	RM



Parts List			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	.HC-1036	CRANK HANDLE, REWORK
2	1	BRG-1097	PILLOW BLOCK, 5/8"
3	1	CF20-0041-4	ARM (SUCTION CUPS)
4	1	CF20-0101H-4	80/20 EXTRUSION
5	1	CF20-0103-4	GUIDE UNIT, SHORT
6	1	CF20-0105-4	SUCTION CUP BLOCK
7	1	CF20-0388-4	BLOCK, ROTARY
8	1	CF20-0406-5	POST, BOX OPENING
9	1	CF20-0407-4	PLATE, ROTARY ACTUATOR
10	1	CF20-0408-4	BRACKET, NUT
11	1	CF20-0409-4	LEAD SCREW, BOX OPENING
12	1	CF20-0511-3	SPACER, BOX OPENING ASSY
13	1	CF20-0528-3	MOUNTING PLATE, BOX OPENING ASSY
14	1	CF50-0135R-4	NUT PLATE, RH THRD
15	2	FFWSDP	FLAT WASHER 1/4
16	9	FHFNMHP	HEX NUT, M8
17	4	FHHMG020P10	HHCS M6 X 20
18	4	FHHMH020P10	HHCS M8 X 20
19	5	FHHMH025P10	HHCS M8 X 25
20	4	FHHMH030S10	HHCS M8 x 30
21	4	FHHMH040P10	HHCS M8 X 40
22	4	FHHMH045P10	HHCS M8 X 45
23	4	FLWMGP	LOCK WASHER M6
24	20	FLWMHP	LOCK WASHER M8
25	2	FSHMH065P10	SHCS M8 X 65
26	3	FSSMG008B10	SSCP M6 X 8
27	2	HC-1046	HAND KNOB
28	1	N401-294	ROTARY ACTUATOR
29	2	N591	FLOW CONTROL, 1/4 NPT X 1/4 TUBE
30	2	N612	REED SWITCH
31	1	PF-18	ELBOW, 1/4NPT X 3/8 PUSHLOC
32	1	PF-32	3/8 CLOSE NIPPLE, BRASS
33	1	VC-1001	VACUUM CUP

MAT'L	PART #	CAD FILE .BXOCF20-D.idw	TOLERANCES UNLESS OTHERWISE NOTED:
	STD	PLOT DATE	
ST. ST.		DRAWN DATE 2/23/2010	.X =±.050 INCH .XX =±.015 .XXX =±.005 ANGLES ±1/2°
STAINLESS : NO FINISH		DO NOT SCALE PRINT	.X =±1.0mm METRIC .XX =±.3mm .XXX =±.1mm MACH. FINISH
FRACTIONS ±1/64			

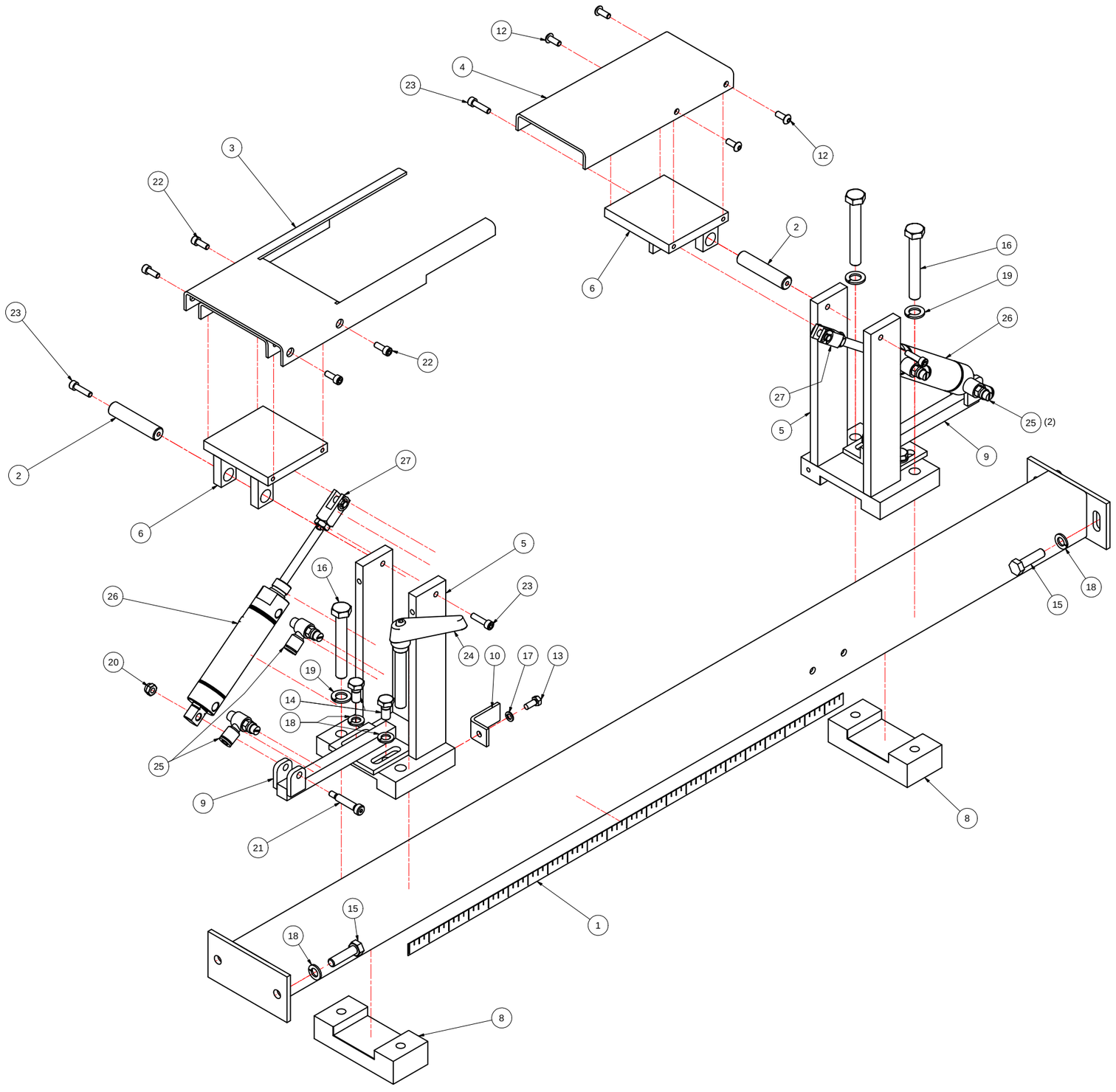
LOVESHAW an ITW Company
RT. 296, SOUTH CANAAN, PA.

TITLE: BOX OPENING ASSEMBLY, CF20-T

DWG NO .BXOCF20-D	SCALE
MATERIAL	CHECKED
DRAWN richm	APPROVED

richm

REVISION HISTORY			
REV	DESCRIPTION	DATE	BY
A	RELEASED	2/10/2010	RM



Parts List			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	40-026	SCALE
2	2	CF20-0026-3	PIVOT SHAFT
3	1	CF20-0028-5	FLAP FOLDER FRONT
4	1	CF20-0029-5	FLAP FOLDER REAR
5	2	CF20-0367-5	FLAP FOLDER BRACKET
6	2	CF20-0368-4	PIVOT BRACKET, FLAP FOLDER
7	1	CF20-0375-5	MOUNT, FLAP FOLDER
8	2	CF20-0376-3	CLAMP, FLAP FOLDER
9	2	CF20-0438-4	BRACKET, FLAP FOLDER CYLINDER
10	1	CF20-0545-3	POINTER, FRONT FLAP FOLDER
12	4	FBHSD050P05	BHCS 10-32 X 1/2
13	1	FHHMF012910	HHCS M5 X 12
14	4	FHHMH016P10	HHCS M8 X 16
15	4	FHHMH030S10	HHCS M8 X 30
16	3	FHHMI070P88	HHCS M10 X 70
17	1	FLWMFP	LOCK WASHER M5
18	8	FLWMHP	LOCK WASHER M8
19	3	FLWMIP	LOCK WASHER M10
20	2	FNLNSCP	NYLOCK NUT, 10-24
21	2	FSBSC100B08	SHOULDER BOLT 1/4 x 1 LG, 10-24
22	4	FSHSD050P05	SHCS 10-32 X 1/2
23	4	FSHSD075B05	SHCS 10-32 X 3/4
24	1	HC-1032	RATCHET HANDLE
25	4	N400-183	SPEED CONTROL, 90 DEG
26	2	N401-298	CYLINDER
27	2	N559	ROD CLEVIS

MAT'L	PART #	CAD FILE .FFACF20-D.idw	TOLERANCES UNLESS OTHERWISE NOTED:
	STD	PLOT DATE	
ST. ST.		DRAWN DATE 2/10/2010	INCH .X =±.050 .XX =±.015 .XXX =±.005 ANGLES ±1/2°
STAINLESS : NO FINISH		DO NOT SCALE PRINT	METRIC .X =±1.0mm .XX =±.3mm .XXX =±.1mm MACH. FINISH
			FRACTIONS ±1/64

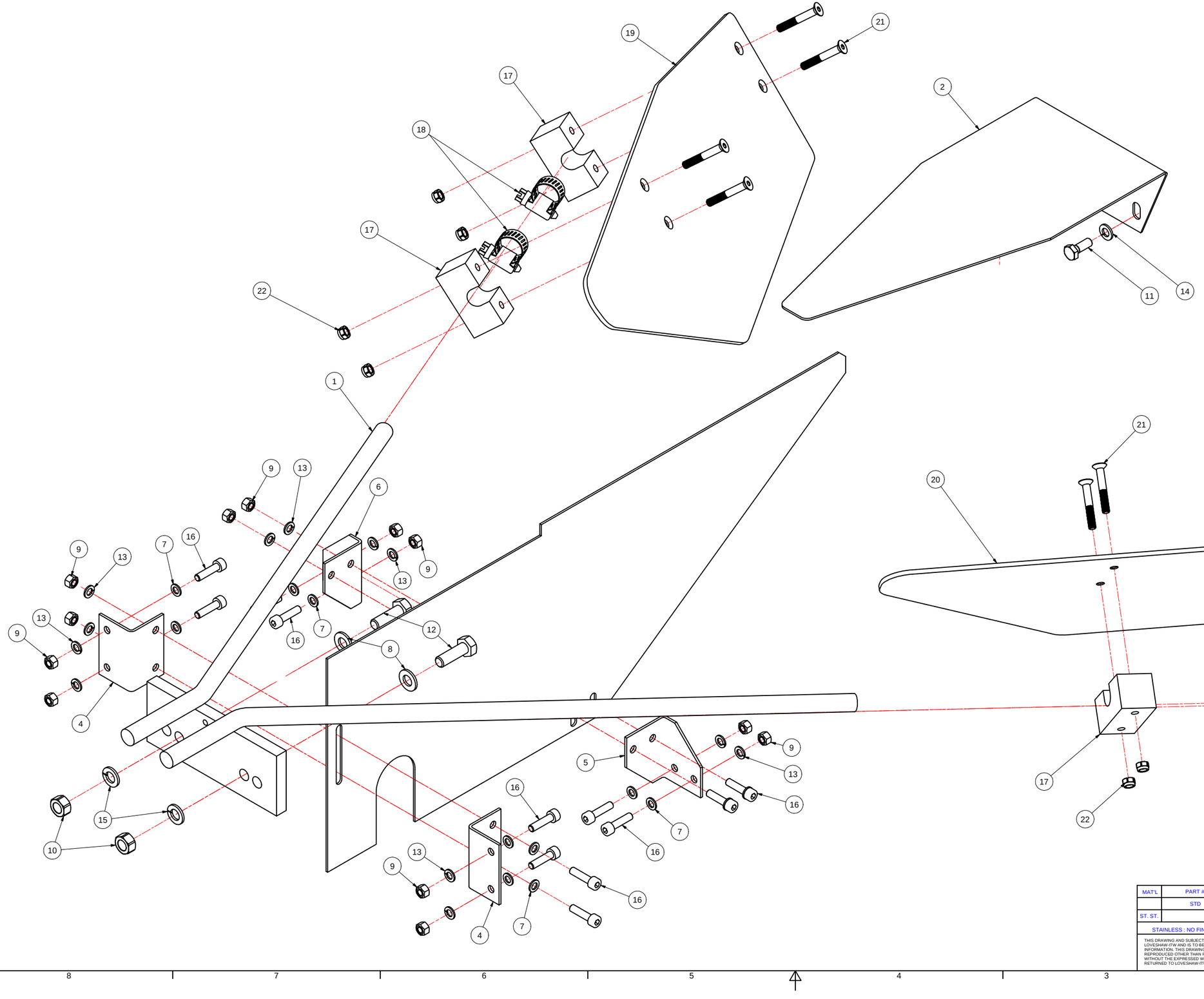
LOVESHAW an ITW Company
RT. 296, SOUTH CANAAN, PA.

TITLE: FLAP FOLDER ASSEMBLY

DWG NO .FFACF20-D2	SCALE
MATERIAL	CHECKED
DRAWN richm	APPROVED

richm

REVISION HISTORY			
REV	DESCRIPTION	DATE	BY
A	RELEASED	2/10/2010	RM



Parts List			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	CF20-0015-5	FOLDING BARS WELDMENT
2	1	CF20-0382-4	ANVIL EXTENSION
3	1	CF20-0436-4	CENTER PLATE
4	2	CF20-0437-3	BRACKET, CENTER PLATE
5	1	CF20-0522L-4	BRACKET, CENTER PLATE, LEFT
6	1	CF20-0522R-4	BRACKET, CENTER PLATE, RIGHT
7	12	FFWMFP	FLAT WASHER M5
8	2	FFWMHP	FLAT WASHER M8
9	12	FHFNMFP	HEX NUT M5
10	2	FHFNMHP	HEX NUT, M8
11	2	FHHMG016P10	HHCS M6 X 16
12	2	FHHMH025P10	HHCS M8 X 25
13	12	FLWMFP	LOCK WASHER M5
14	2	FLWMGP	LOCK WASHER M6
15	2	FLWMHP	LOCK WASHER M8
16	12	FSHMF020P10	SHCS M5 X 0.8 X 20 LG.
17	4	B622732	BLOCK, PREFOLD PIVOT
18	4	H149A	CLAMP
19	1	CF20-0557R-4	PLATE, MAJOR FLAP FOLDER, RIGHT
20	1	CF20-0557L-4	PLATE, MAJOR FLAP FOLDER, LEFT
21	8	FFHMF035P10	FHCS M5 X 35
22	8	FNLNMFS	M5 NYLON LOCKING NUT

MAT'L	PART #	CAD FILE .ATACF20-D.idw	TOLERANCES UNLESS OTHERWISE NOTED:
	STD	PLOT DATE	
ST. ST.		DRAWN DATE 2/10/2010	.X =±.050 INCH .XX =±.015 .XXX =±.005 ANGLES ±1/2°
STAINLESS : NO FINISH		DO NOT SCALE PRINT	.X =±1.0mm METRIC .XX =±.3mm .XXX =±.1mm MACH. FINISH

FRACTIONS ±1/64

LOVESHAW an *ITW* Company
RT. 296, SOUTH CANAAN, PA.

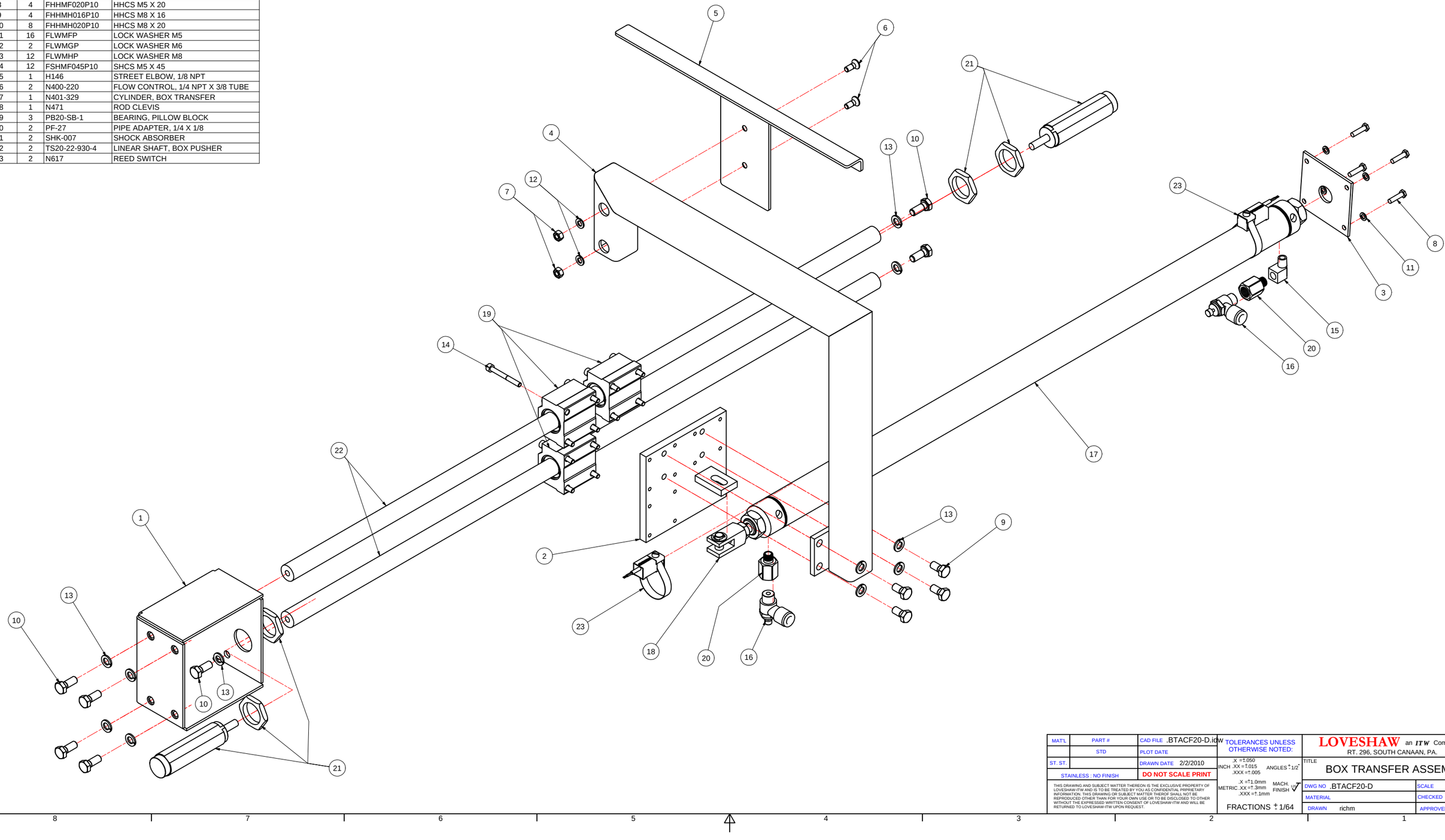
TITLE
ANVIL TABLE ASSEMBLY

DWG NO .ATACF20-D	SCALE
MATERIAL	CHECKED
DRAWN richm	APPROVED

richm

Parts List			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	CF20-0386-5	MOUNT, LINEAR SHAFT
2	1	CF20-0412-4	BEARING PLATE, 1ST PUSHER
3	1	CF20-0489-3	PLATE, CYLINDER MOUNTING
4	1	CF20-0518-5	ARM, BOX TRANSFER
5	1	CF20-0531-4	TEE PLATE, BOX TRANSFER
6	2	FFHMG016P10	FHCS M6 X 16
7	2	FHFNMGP	HEX NUT M6
8	4	FHHMF020P10	HHCS M5 X 20
9	4	FHHMH016P10	HHCS M8 X 16
10	8	FHHMH020P10	HHCS M8 X 20
11	16	FLWMFP	LOCK WASHER M5
12	2	FLWMGP	LOCK WASHER M6
13	12	FLWMHP	LOCK WASHER M8
14	12	FSHMF045P10	SHCS M5 X 45
15	1	H146	STREET ELBOW, 1/8 NPT
16	2	N400-220	FLOW CONTROL, 1/4 NPT X 3/8 TUBE
17	1	N401-329	CYLINDER, BOX TRANSFER
18	1	N471	ROD CLEVIS
19	3	PB20-SB-1	BEARING, PILLOW BLOCK
20	2	PF-27	PIPE ADAPTER, 1/4 X 1/8
21	2	SHK-007	SHOCK ABSORBER
22	2	TS20-22-930-4	LINEAR SHAFT, BOX PUSHER
23	2	N617	REED SWITCH

REVISION HISTORY			
REV	DESCRIPTION	DATE	BY
A	RELEASED	2/2/2010	RM



MAT'L	PART #	CAD FILE .BTACF20-D.idw	
	STD	PLOT DATE	
ST. ST.		DRAWN DATE 2/2/2010	
STAINLESS : NO FINISH		DO NOT SCALE PRINT	

TOLERANCES UNLESS OTHERWISE NOTED:

INCH .X =±.050 .XX =±.015 .XXX =±.005 ANGLES ±1/2°

METRIC .X =±1.0mm .XX =±.3mm .XXX =±.1mm MACH. FINISH

FRACTIONS ±1/64

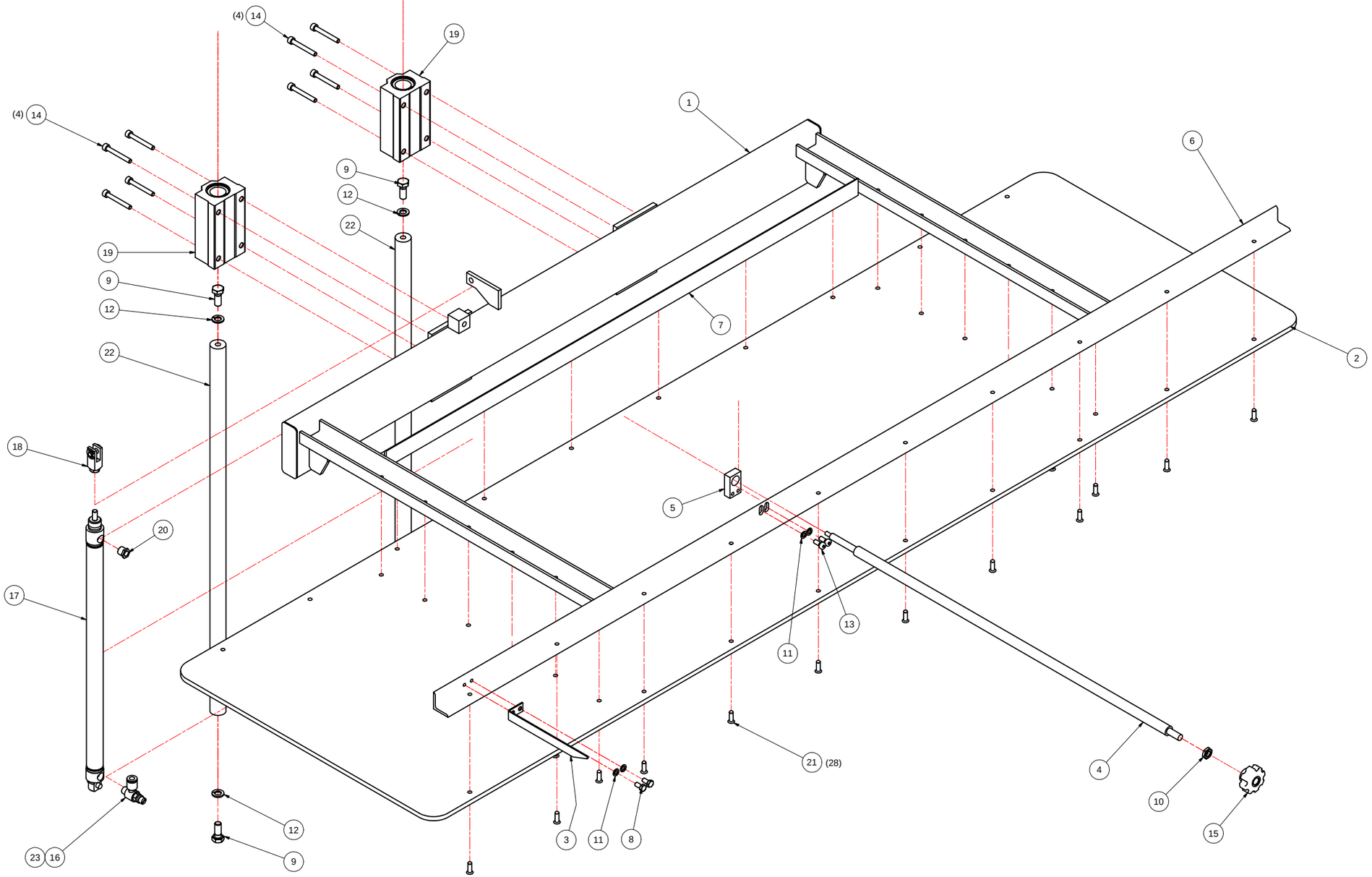
LOVESHAW an *ITW* Company
RT. 296, SOUTH CANAAN, PA.

TITLE
BOX TRANSFER ASSEMBLY

DWG NO .BTACF20-D	SCALE
MATERIAL	CHECKED
DRAWN richm	APPROVED

richm

REVISION HISTORY			
REV	DESCRIPTION	DATE	BY
A	RELEASED	2/23/2010	RM



Parts List			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	CF20-0366-6	SLED MOUNT
2	1	CF20-0377-6	TOP SLED, PLASTIC
3	1	CF20-0510-4	POINTER, SLED
4	1	CF20-0519-4	ROD, SLED LOCK
5	1	CF20-0520-3	BLOCK, SLED ROD SUPPORT
6	1	CF20-0521-4	ANGLE, SLED
7	1	CF20-0550-4	ANGLE, SLED, SHORT
8	2	FHHMF010P10	HHCS M5 X 10
9	4	FHHMH020P10	HHCS M8 X 20
10	1	FHJNMHP	HEX JAM NUT, M8
11	4	FLWMFP	LOCK WASHER M5
12	4	FLWMHP	LOCK WASHER M8
13	2	FSHMF012P10	SHCS M5 X 12
14	8	FSHMF040P10	SHCS M5 X 40
15	1	HC-1044	KNOB
16	1	N400-183	SPEED CONTROL, 90 DEG
17	1	N401-292	AIR CYLINDER
18	1	N524	CLEVIS
19	2	PB20-SB-2	LINEAR BEARING
20	1	PSR659	BREATHER
21	28	SPH-1258	RIVET, C'SUNK
22	2	TS20-22-555-4	LINEAR SHAFT, SLED
23	1	N367-N	BLOCKING VALVE (NOT SHOWN)

MAT'L	PART #	CAD FILE .SLACF20-D.idw	
	STD	PLOT DATE	
ST. ST.		DRAWN DATE 2/23/2010	
STAINLESS : NO FINISH		DO NOT SCALE PRINT	

TOLERANCES UNLESS OTHERWISE NOTED:

INCH .X =±.050 .XX =±.015 .XXX =±.005 ANGLES ±1/2°

METRIC .X =±1.0mm .XX =±.3mm .XXX =±.1mm

MACH. FINISH

FRACTIONS ±1/64

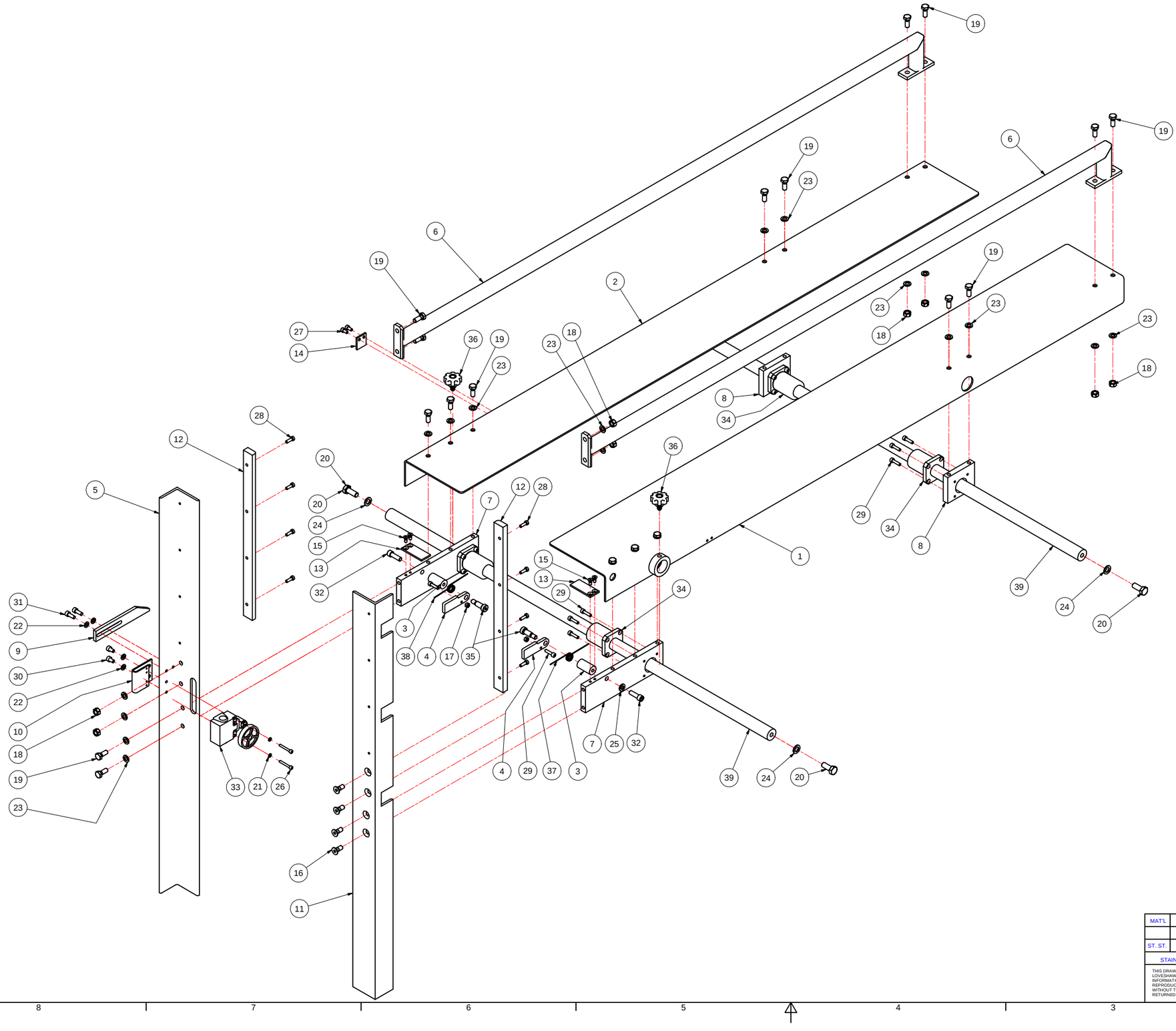
LOVESHAW an ITW Company
RT. 296, SOUTH CANAAN, PA.

TITLE: SLED ASSEMBLY, CF20-T

DWG NO .SLACF20-D	SCALE
MATERIAL	CHECKED
DRAWN richm	APPROVED

richm

REVISION HISTORY			
REV	DESCRIPTION	DATE	BY
A	RELEASED	2/9/2010	RM



Parts List			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	CF20-0417L-5	ANGLE, HOPPER BED, LEFT
2	1	CF20-0417R-5	ANGLE, HOPPER BED, RIGHT
3	2	CF20-0421-3	HUB, HOPPER SPRING
4	2	CF20-0422-3	LATCH, HOPPER
5	1	CF20-0423-5	GUIDE, VERTICAL, RIGHT
6	2	CF20-0432-4	SIDE RAIL, HOPPER
7	2	CF20-0441-4	BRACKET, LARGE, HOPPER
8	2	CF20-0442-3	BRACKET, SMALL, HOPPER
9	1	CF20-0443-3	RAMP, HOPPER
10	1	CF20-0444-4	BRACKET, LIMIT SWITCH
11	1	CF20-0476-5	BOX GUIDE, VERTICLE, LEFT
12	2	CF20-0523-4	GUIDE STRIP, HOPPER
13	2	CF20-0549-3	PLATE, STRIPPER, SINGLE WALL
14	1	CF20-0551-3	POINTER
15	4	FFHMF012P10	FHCS M5 X 12
16	4	FFHMH020P10	FHCS M8 X 20
17	2	FHFNMFP	HEX NUT M5
18	8	FHFNMHP	HEX NUT, M8
19	18	FHHMH020P10	HHCS M8 X 20
20	4	FHHMI025P88	HHCS M10 X 25
21	2	FLWMEP	LOCK WASHER M4
22	4	FLWMGP	LOCK WASHER M6
23	20	FLWMHP	LOCK WASHER M8
24	4	FLWMIP	LOCK WASHER M10
25	2	FLWSEP	LOCK WASHER 5/16
26	2	FSHME030P10	SHCS M4 X 30
27	2	FSHMF010B10	SHCS M5 X 10
28	8	FSHMF016P10	M5 X 16 SHCS
29	18	FSHMF020P10	SHCS M5 X 20
30	2	FSHMG010P10	SHCS M6 X 10
31	2	FSHMG016P10	SHCS M6 X 16
32	2	FSHSH100B05	SHCS 5/16-18 X 1.00
33	1	LDF512-L	LIMIT SWITCH
34	4	PBF25-SB-1	LINEAR BEARING, FLANGED, 25MM
35	2	SPH-1380	SHOULDER BOLT, 3/8 DIA X 3/4 LG.
36	2	SPH-1390	LOCKING KNOB
37	1	SPR-1065L	TORSION SPRING
38	1	SPR-1065R	TORSION SPRING
39	2	TS25-11-1085-4	LINEAR SHAFT

MAT'L	PART #	CAD FILE .HFACF20-D3.dwg	TOLERANCES UNLESS OTHERWISE NOTED:
	STD	PLOT DATE	
ST. ST.		DRAWN DATE 2/9/2010	INCH .X =±.050 .XX =±.015 .XXX =±.005 ANGLES ±1/2°
STAINLESS : NO FINISH		DO NOT SCALE PRINT	METRIC .X =±1.0mm .XX =±.3mm .XXX =±.1mm MACH. FINISH √
			FRACTIONS ±1/64

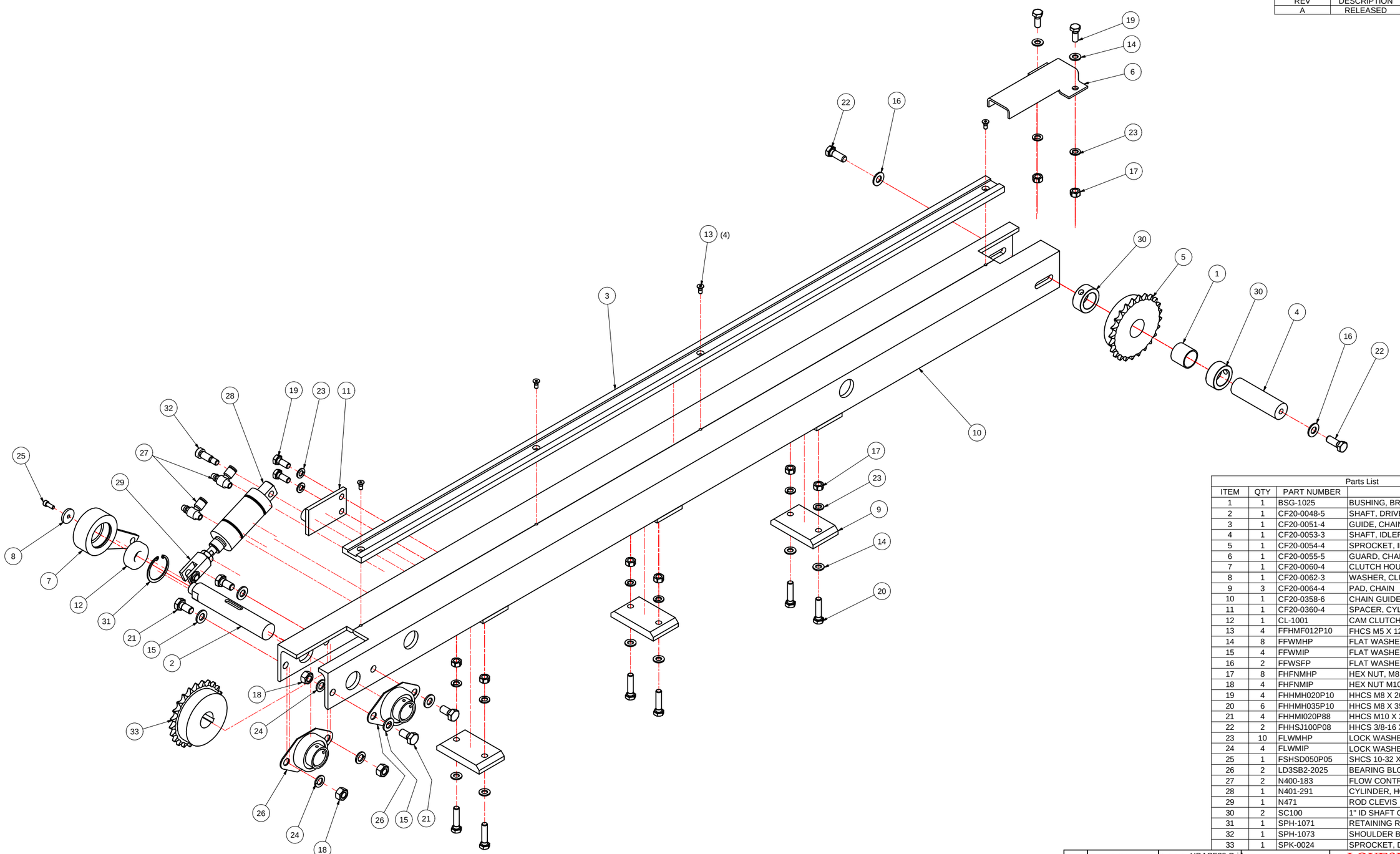
LOVESHAW an ITW Company
RT. 296, SOUTH CANAAN, PA.

TITLE: HOPPER FRAME ASSY

DWG NO .HFACF20-D3	SCALE
MATERIAL	CHECKED
DRAWN richm	APPROVED

richm

REVISION HISTORY			
REV	DESCRIPTION	DATE	BY
A	RELEASED	2/18/2010	RM



Parts List			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	BSG-1025	BUSHING, BRONZE
2	1	CF20-0048-5	SHAFT, DRIVE HOPPER
3	1	CF20-0051-4	GUIDE, CHAIN UHMW
4	1	CF20-0053-3	SHAFT, IDLER
5	1	CF20-0054-4	SPROCKET, IDLER
6	1	CF20-0055-5	GUARD, CHAIN
7	1	CF20-0060-4	CLUTCH HOUSING
8	1	CF20-0062-3	WASHER, CLUTCH
9	3	CF20-0064-4	PAD, CHAIN
10	1	CF20-0358-6	CHAIN GUIDE MOUNT
11	1	CF20-0360-4	SPACER, CYLINDER
12	1	CL-1001	CAM CLUTCH
13	4	FFHMF012P10	FHCS M5 X 12
14	8	FFWMHP	FLAT WASHER M8
15	4	FFWMIP	FLAT WASHER M10
16	2	FFWSFP	FLAT WASHER 3/8
17	8	FHFNMHP	HEX NUT, M8
18	4	FHFNMIP	HEX NUT M10
19	4	FHHMH020P10	HHCS M8 X 20
20	6	FHHMH035P10	HHCS M8 X 35
21	4	FHHMI020P88	HHCS M10 X 20
22	2	FHHSJ100P08	HHCS 3/8-16 X 1
23	10	FLWMHP	LOCK WASHER M8
24	4	FLWMIP	LOCK WASHER M10
25	1	FSHSD050P05	SHCS 10-32 X 1/2
26	2	LD3SB2-2025	BEARING BLOCK
27	2	N400-183	FLOW CONTROL
28	1	N401-291	CYLINDER, HOPPER DRIVE
29	1	N471	ROD CLEVIS
30	2	SC100	1" ID SHAFT COLLAR
31	1	SPH-1071	RETAINING RING, INTERNAL
32	1	SPH-1073	SHOULDER BOLT
33	1	SPK-0024	SPROCKET, DRIVE

MAT'L	PART #	CAD FILE .HDACF20-D.idw	TOLERANCES UNLESS OTHERWISE NOTED:
	STD	PLOT DATE	
ST. ST.		DRAWN DATE 2/18/2010	.X =±.050 INCH .XX =±.015 .XXX =±.005 ANGLES ±1/2°
STAINLESS : NO FINISH		DO NOT SCALE PRINT	.X =±1.0mm METRIC .XX =±.3mm .XXX =±.1mm MACH. FINISH

FRACTIONS ±1/64

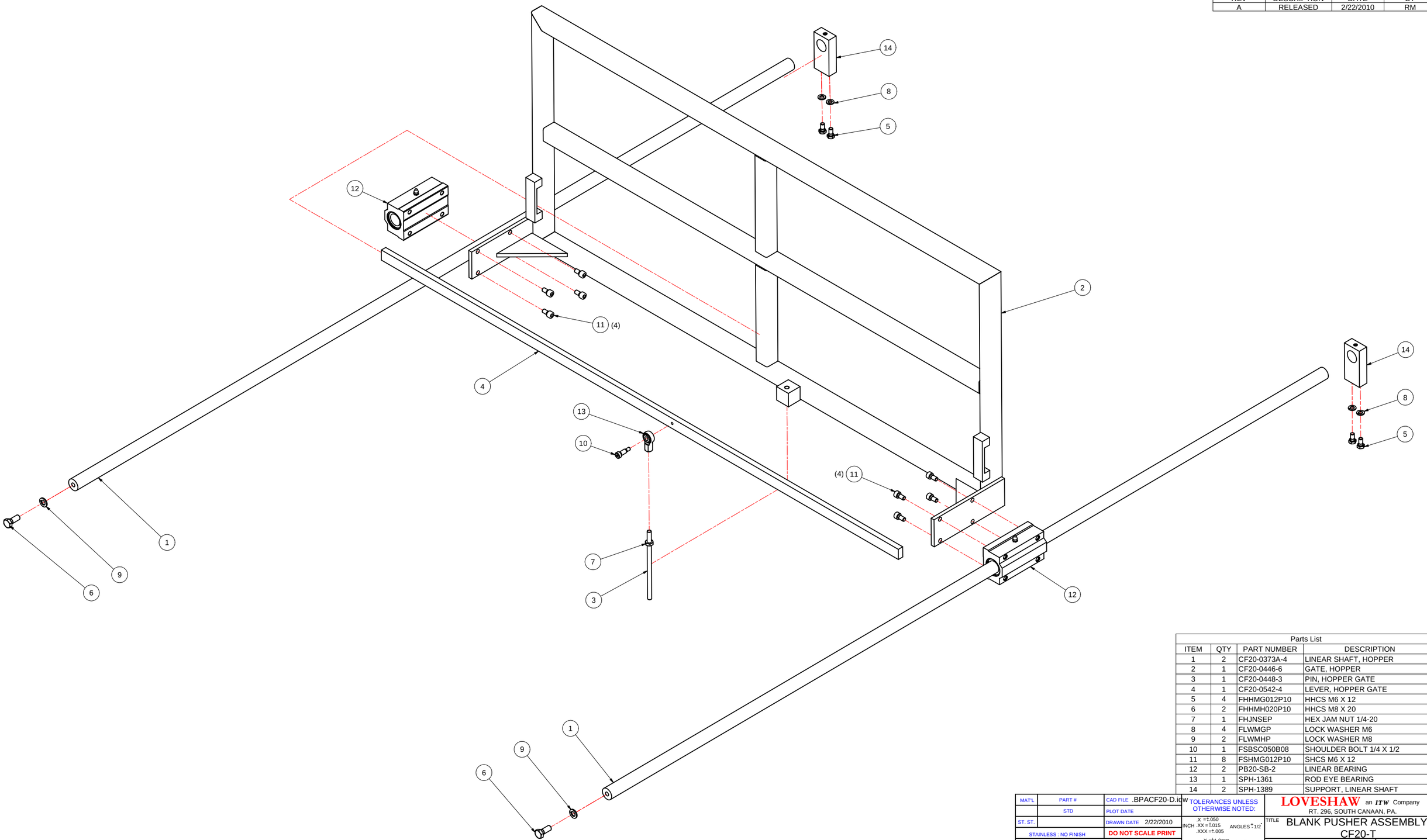
LOVESHAW an ITW Company
RT. 296, SOUTH CANAAN, PA.

TITLE
HOPPER DRIVE ASSEMBLY

DWG NO .HDACF20-D	SCALE
MATERIAL	CHECKED
DRAWN richm	APPROVED

richm

REVISION HISTORY			
REV	DESCRIPTION	DATE	BY
A	RELEASED	2/22/2010	RM



Parts List			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	2	CF20-0373A-4	LINEAR SHAFT, HOPPER
2	1	CF20-0446-6	GATE, HOPPER
3	1	CF20-0448-3	PIN, HOPPER GATE
4	1	CF20-0542-4	LEVER, HOPPER GATE
5	4	FHHMG012P10	HHCS M6 X 12
6	2	FHHMH020P10	HHCS M8 X 20
7	1	FHJNSEP	HEX JAM NUT 1/4-20
8	4	FLWMGP	LOCK WASHER M6
9	2	FLWMHP	LOCK WASHER M8
10	1	FSBSC050B08	SHOULDER BOLT 1/4 X 1/2
11	8	FSHMG012P10	SHCS M6 X 12
12	2	PB20-SB-2	LINEAR BEARING
13	1	SPH-1361	ROD EYE BEARING
14	2	SPH-1389	SUPPORT, LINEAR SHAFT

MAT'L	PART #	CAD FILE .BPACF20-D.idw	TOLERANCES UNLESS OTHERWISE NOTED:
	STD	PLOT DATE	
ST. ST.		DRAWN DATE 2/22/2010	.X =±.050 ANGLES ±1/2°
STAINLESS : NO FINISH		DO NOT SCALE PRINT	INCH .XX =±.015 .XXX =±.005
			.X =±1.0mm MACH. FINISH
			METRIC .XX =±.3mm .XXX =±.1mm
			FRACTIONS ±1/64

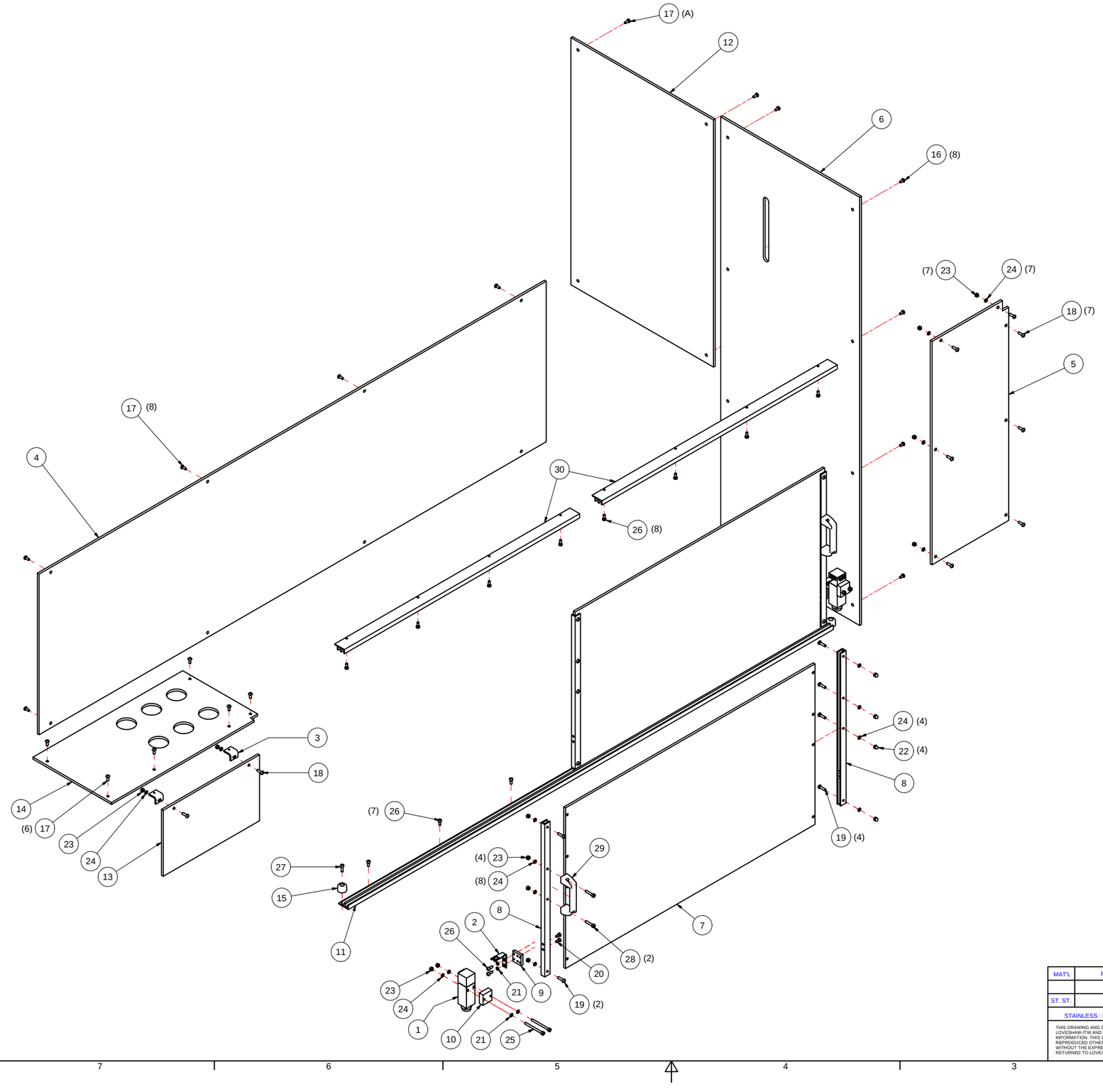
LOVESHAW an ITW Company
RT. 296, SOUTH CANAAN, PA.

TITLE: BLANK PUSHER ASSEMBLY, CF20-T

DWG NO .BPACF20-D2	SCALE
MATERIAL	CHECKED
DRAWN richm	APPROVED

richm

REVISION HISTORY			
REV	DESCRIPTION	DATE	BY
A	RELEASED	2/22/2010	RM



Parts List			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	2	A195SG-TM1	SAFETY GATE SWITCH
2	2	A195SG-TM1 KEY	SWITCH KEY
3	2	CF20-0123-3	PANEL BRACKET
4	1	CF20-0333-6	GUARD STATIONARY
5	1	CF20-0340-5	GUARD, SIDE, UPPER
6	1	CF20-0343-6	GUARD, VERTICLE FEEDER
7	2	CF20-0418-4	PANEL, SLIDING
8	4	CF20-0419-4	SIDE CHANNEL, SAFETY GATE
9	2	CF20-0439-3	PLATE, KEY MOUNTING
10	2	CF20-0440-3	SPACER, SAFETY SWITCH
11	1	CF20-0474-4	TRACK, SAFETY GATE
12	1	CF20-0539-5	GUARD, FRONT PANEL
13	1	CF20-0547-4	GUARD, MOTOR, SIDE
14	1	CF20-0548-4	GUARD, MOTOR, TOP
15	2	F3MB	RUBBER BUMPER
16	8	FBHMF010P10	BHCS M5 X 10
17	18	FBHMF012P10	BHCS M5 X 12
18	9	FBHMF016P10	BHCS M5 X 16
19	12	FBHMF020P10	BHCS M5 X 20
20	4	FFHMF012P10	FHCS M5 X 12
21	6	FFWMFP	FLAT WASHER M5
22	4	FHDNMFP	HEX DOME NUT M5
23	25	FHFNMFP	HEX NUT M5
24	31	FLWMFP	LOCK WASHER M5
25	4	FSHM060B08	SHCS M5 X 60
26	19	FSHMF012P10	SHCS M5 X 12
27	2	FSHMF016P10	SHCS M5 X 16
28	4	FSHMF025B10	SHCS M5 X 25
29	2	HC-1004	U-HANDLE
30	2	LD12B-2096-4	SAFETY GATE SLIDE

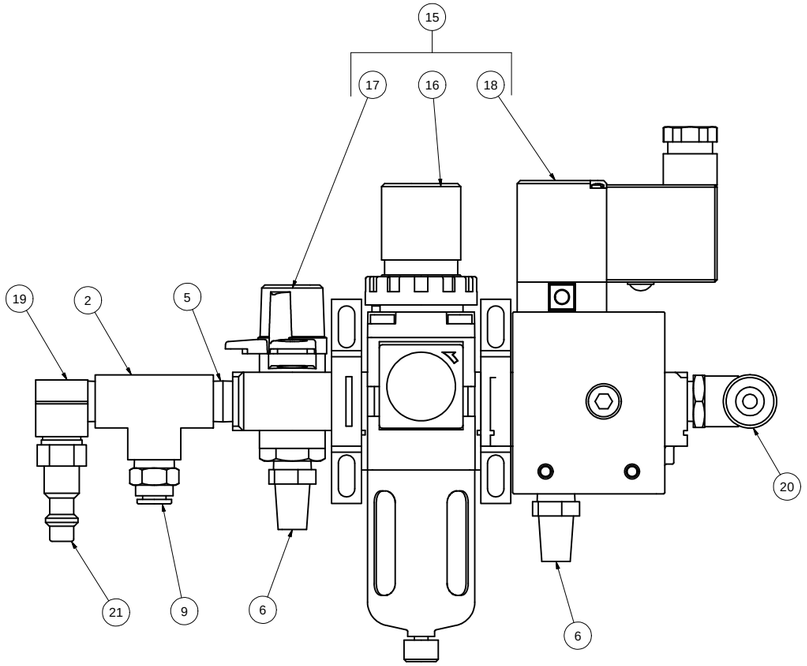
MAT'L	PART #	CAD FILE .MGACF20-D.idw	TOLERANCES UNLESS OTHERWISE NOTED:
	STD	PLOT DATE	LOVESHAW an ITW Company
ST. ST.		DRAWN DATE 2/22/2010	RT. 296, SOUTH CANAAN, PA.
STAINLESS : NO FINISH		DO NOT SCALE PRINT	TITLE: MACHINE GUARDING ASSEMBLY, CF20-T

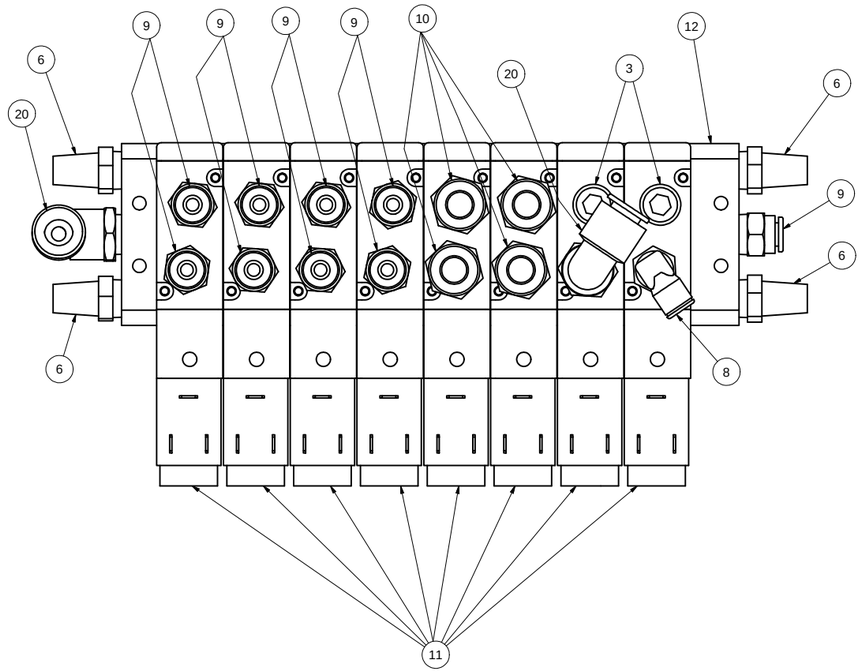
INCH .X =±.050 .XX =±.015 .XXX =±.005 ANGLES ±1/2°
METRIC .X =±1.0mm .XX =±.3mm .XXX =±.1mm MACH. FINISH
FRACTIONS ±1/64

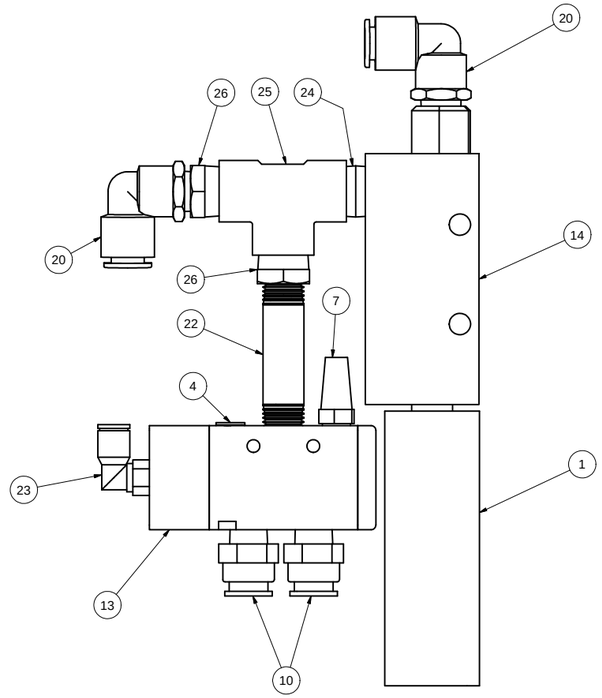
DWG NO .MGACF20-D	SCALE		
MATERIAL	CHECKED		
DRAWN richm	APPROVED		

richm

REVISION HISTORY			
REV	DESCRIPTION	DATE	BY
A	RELEASED	4/9/2010	RM







Parts List			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	402018	MUFFLER, VACUUM GENERATOR
2	1	H104	TEE, BRASS, 1/4 NPT
3	2	H109A	PLUG, HEX 1/4 NPT
4	1	H109B	PLUG, HEX, 1/8 NPT
5	1	H127	NIPPLE, CLOSE, 1/4 NPT
6	6	N400-16	MUFFLER, 1/4 NPT
7	1	N400-17	MUFFLER, 1/8 NPT
8	1	N400-26	ELBOW, 1/4 NPT X 1/4 TUBE
9	10	N400-3	CONNECTOR, STRAIGHT, 1/4 NPT X 1/4 TUBE
10	6	N400-8	CONNECTOR, STRAIGHT, 1/4 NPT X 3/8 TUBE
11	8	N402-133-CE	VALVE SOL 5/2
12	1	N402-133-M	MANIFOLD
13	1	N402-134	VALVE 5/2 AIR PILOT
14	1	N576	VACUUM GENERATOR
15	1	N638	AIR PREP ASSEMBLY
16	1	N639	FILTER REGULATOR
17	1	N640	LOCK-OUT VALVE
18	1	N641	SOFT START/DUMP VALVE
19	1	PF-10	STREET ELBOW, 90, 1/4 NPT, BRASS
20	5	PF-18	ELBOW, 1/4NPT X 3/8 PUSHLOC
21	1	PF-22	QUICK DISCONNECT PLUG, 1/4 NPT
22	1	PF-23	PIPE NIPPLE, 1/4 X 2 1/2
23	1	PF-29	ELBOW, 1/8 NPT X 1/4 PUSH LOC
24	1	PF-32	3/8 CLOSE NIPPLE, BRASS
25	1	PF-35	3/8 TEE, BRASS
26	2	PF-38	REDUCER, 3/8 X 1/4 NPT, BRASS

MAT'L	PART #	CAD FILE .PNEUCF25.idw	TOLERANCES UNLESS OTHERWISE NOTED:
	STD	PLOT DATE	
ST. ST.		DRAWN DATE 4/9/2010	.X =±.050 INCH .XX =±.015 .XXX =±.005 ANGLES ±1/2°
STAINLESS : NO FINISH		DO NOT SCALE PRINT	.X =±1.0mm METRIC .XX =±.3mm .XXX =±.1mm MACH. FINISH
FRACTIONS ±1/64			

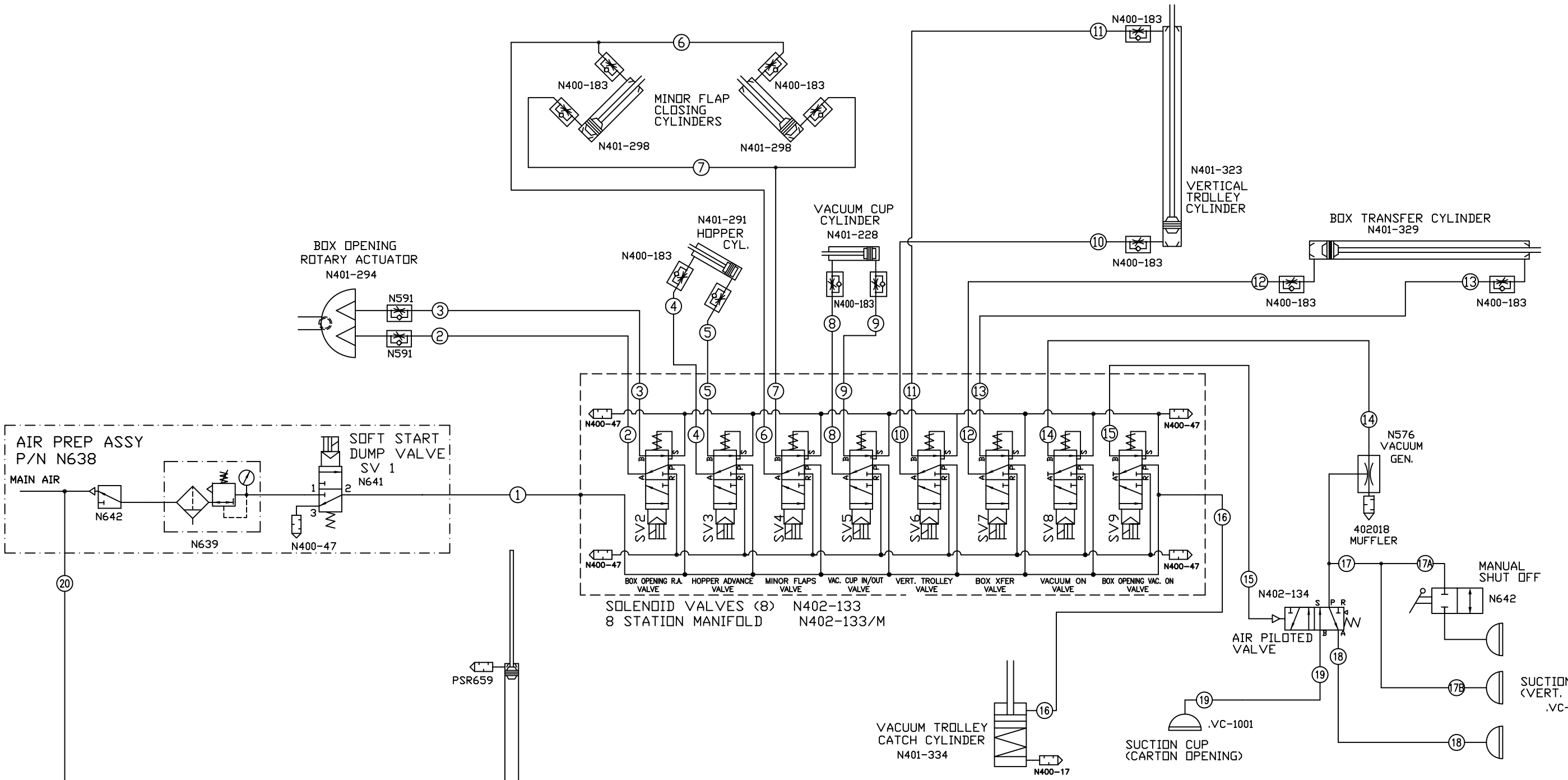
LOVESHAW an ITW Company
RT. 296, SOUTH CANAAN, PA.

TITLE: PNEUMATIC ASSEMBLY CF25-T

DWG NO .PNEUCF25	SCALE
MATERIAL	CHECKED
DRAWN richm	APPROVED

richm

REVISION RECORD					
REV	DESCRIPTION	DATE	ATH	DR	CK
A	RELEASED	12/30/09		RM	



MAT'L	PART #	CAD FILE: G83330	TOLERANCES UNLESSS OTHERWISE NOTED:
C.R.S.	STD	PLOT DATE: 12/30/09	
ST. ST.		DRAWN DATE: 12/30/09	INCH .X = ± .050, .XX = ± .015, .XXX = ± .005
STAINLESS: NO FINISH		DO NOT SCALE PRINT	METRIC .X = ± 1.0mm, .XX = ± .3mm, .XXX = ± .1mm

ANGLES ±1/2° FRACTIONS ±1/64

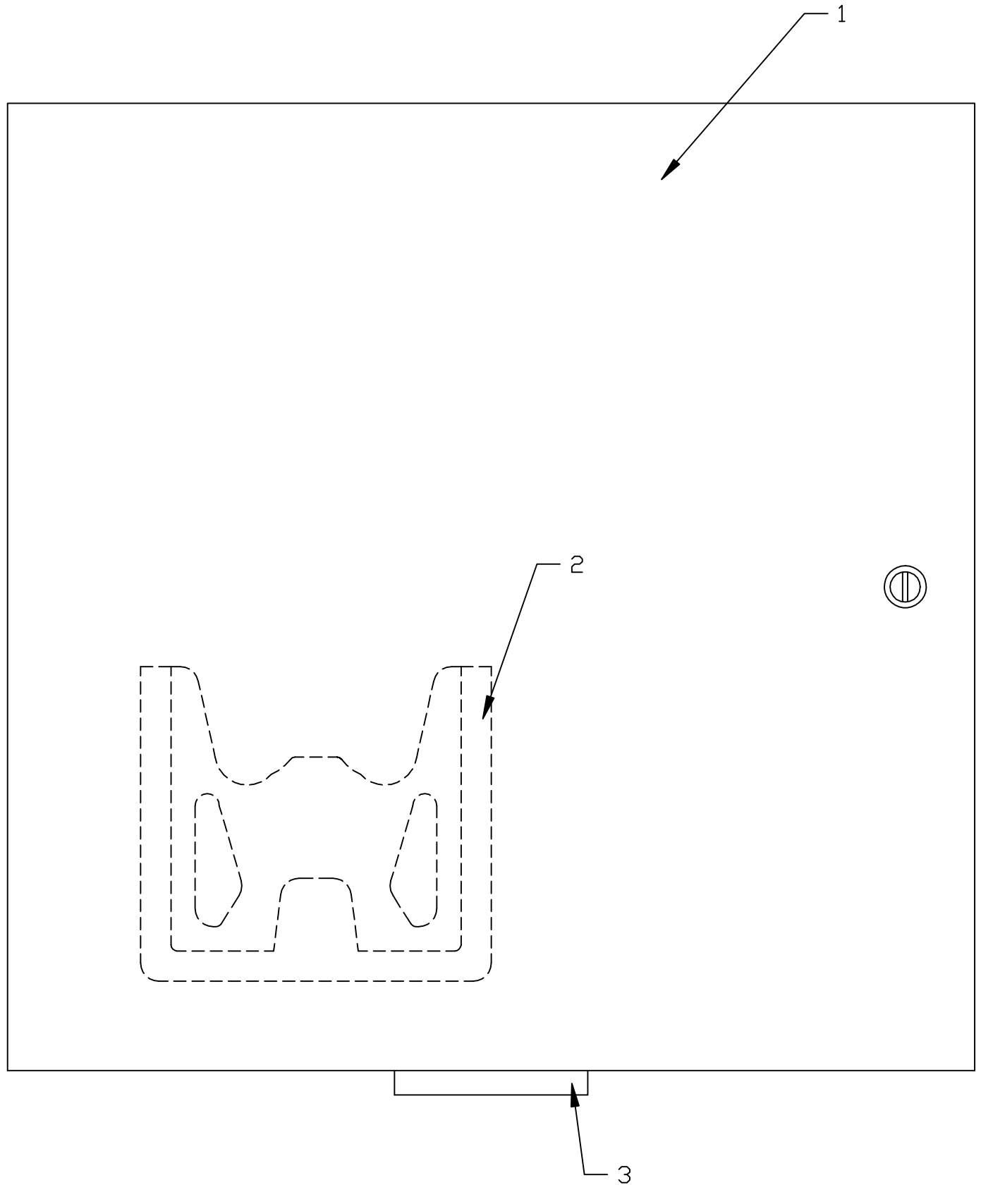
MACHINE FINISH 125

LOVESHAW an ITW Company
RT. 296, SOUTH CANAAN, PA.

TITLE: CASE ERECTOR CF25T
PNEUMATIC SCHEMATIC

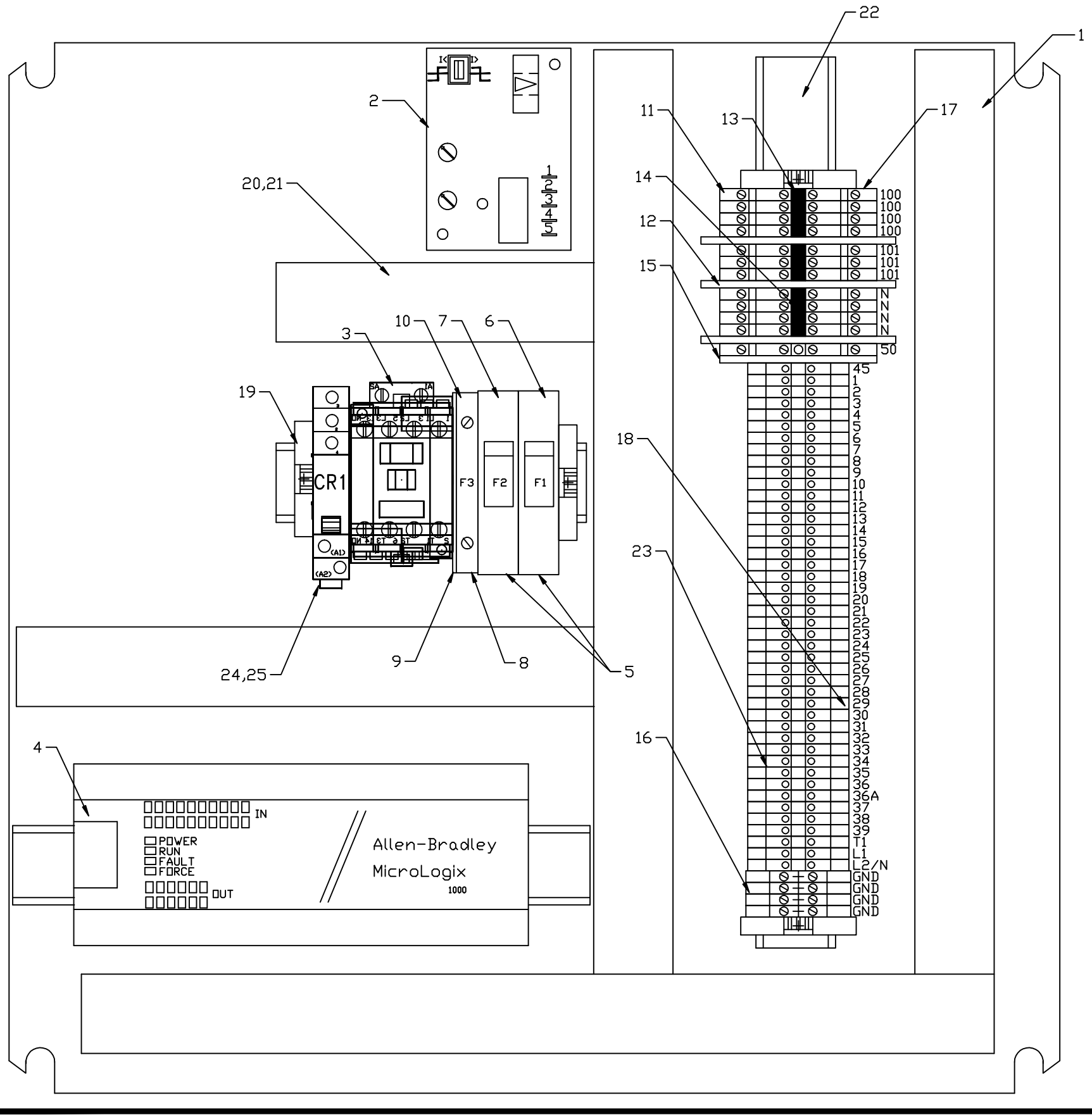
DWG. #: CF20-0544-4		SCALE:
MATERIAL:		CHECK'D:
DESIGNED: RM	DRAWN: RM	APPRV'D:

REVISION RECORD					
REV	DESCRIPTION	DATE	ATH	DR	CK



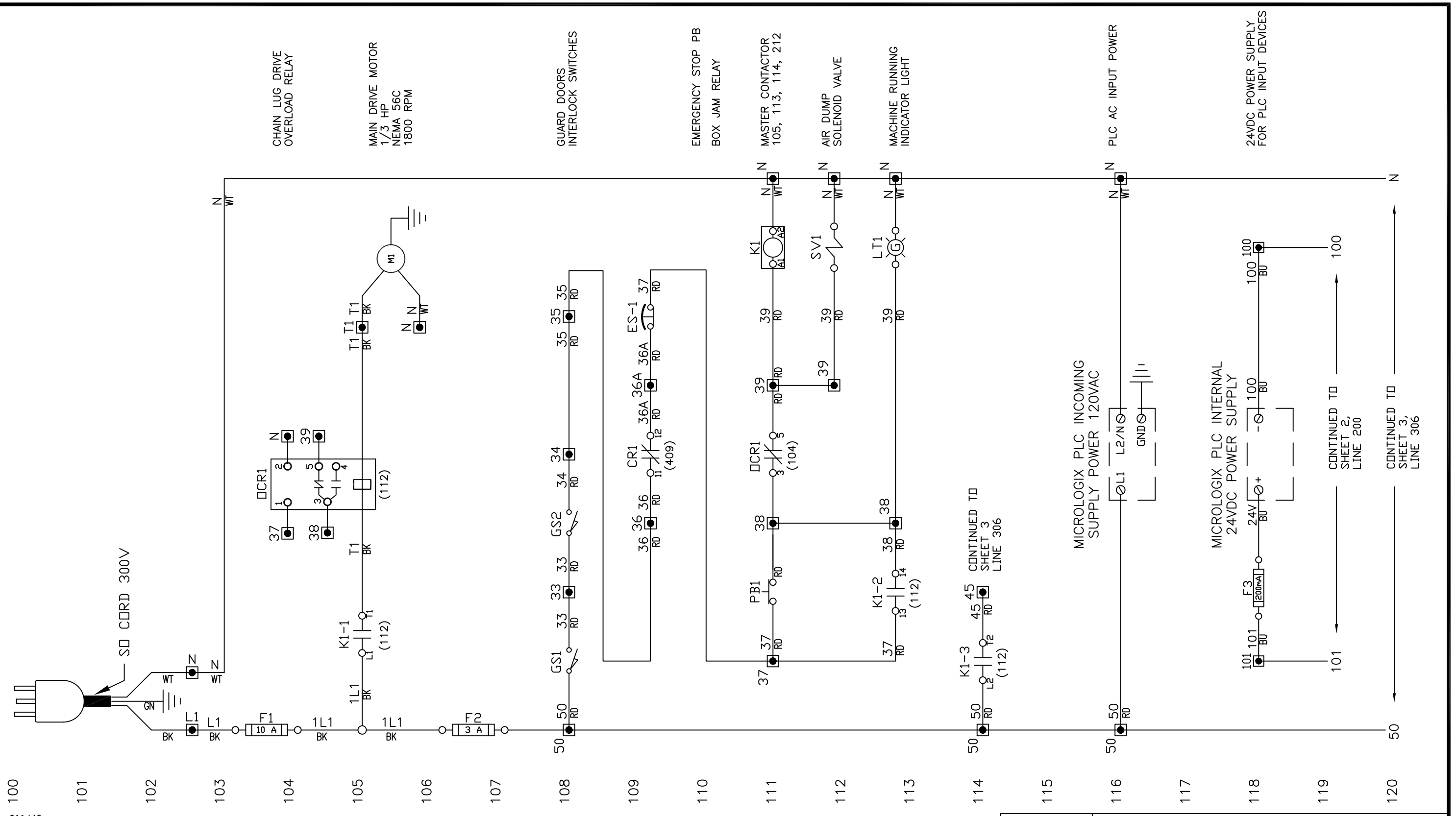
KEY	PART NO.	DESCRIPTION
1	A100N-202006B-1	ENCLOSURE
2	A100N-PP-HOF-1	PRINT POCKET
3	AH-CEP-2	CABLE ENTRY PLATE

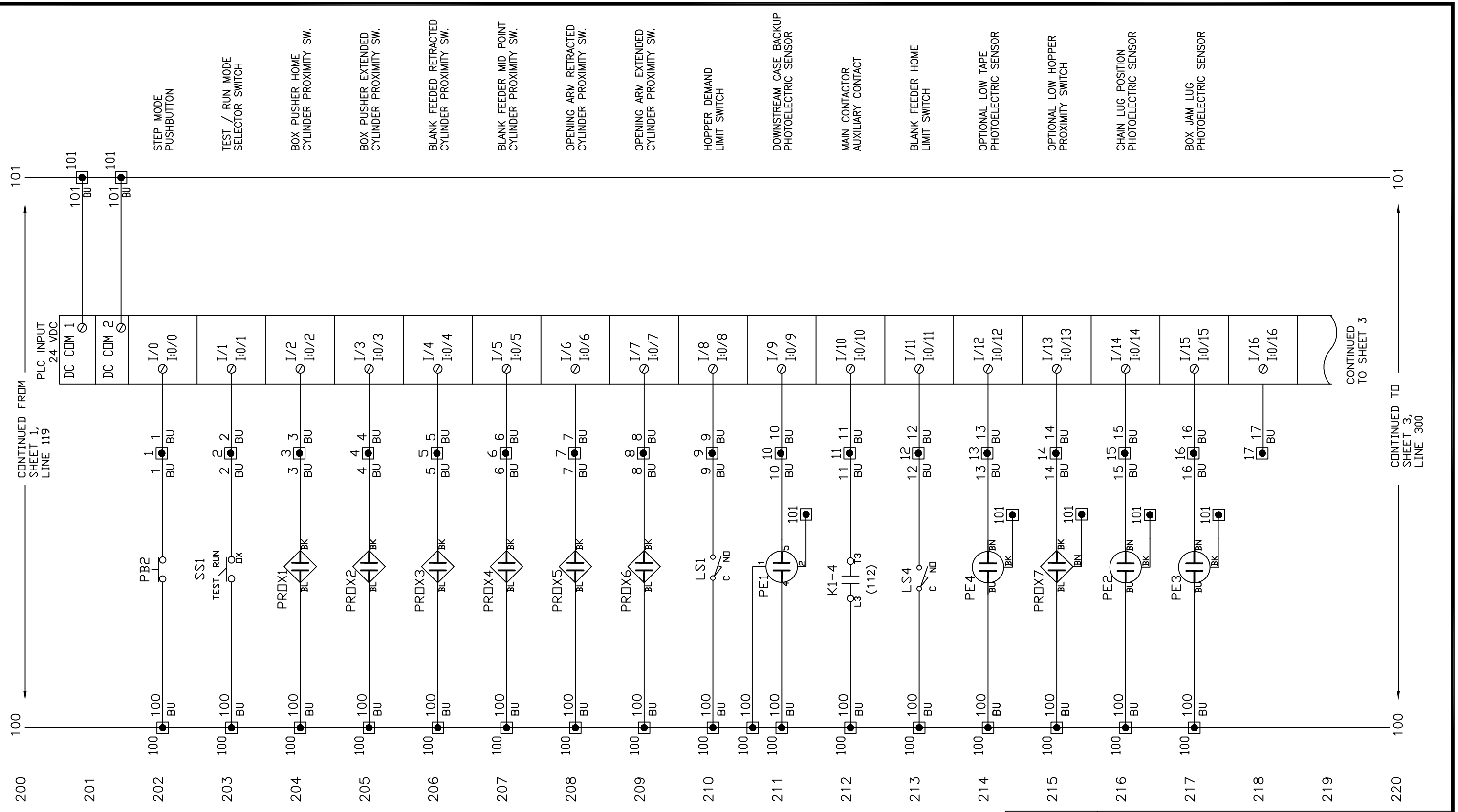
TOLERANCES EXCEPT AS NOTED	*THE LOVESHAW CORPORATION* RT 296, SOUTH CANAAN, PA.		
DECIMAL (3 PLC) +/- .005	TITLE: ELECTRICAL ENCLOSURE ASSEMBLY CF25T – 120/1/60		
FRACTIONAL +/- 1/64	DWG. NO. ED2123		SCALE: 3 : 8
	MATERIAL: COMMERCIAL		DATE: 12/17/09
ANG. – 1/2°	DESIGNED: MENTA	DRAWN: WM	APPRVD: --



KEY	PART NO.	DESCRIPTION
1	A100N-2020P-1	PANEL
2	303111	OVER CURRENT RELAY
3	A106-AB-2A	CONTACTOR
4	A241AB-1000-1DC	PLC
5	A125BH-AB-DIN-3	FUSE HOLDER
6	A125SB-10-R	FUSE, 10 AMP
7	A125SB-3-R	FUSE, 3 AMP
8	A125BH-AB-DIN	FUSE HOLDER
9	A128B-AB16	FUSE BLOCK BARRIER
10	A125SB-2/10-312	FUSE 2/10 AMP
11	A124-AB-JD3C	DOUBLE TERMINAL BLOCK
12	A128-AB-PPJD3	PARTITION PLATE
13	A124-AB-CJ-4	4 POLE CENTER JUMPER
14	A124-AB-CJ-3	3 POLE CENTER JUMPER
15	A128-AB-EBJD3	END PARRIER PLATE
16	A124-AB-JG4	GROUND TERMINAL
17	A124-AB-MARK-DT	TERMINAL MARKER CARD
18	A124-AB-MARK-ST	TERMINAL MARKER CARD
19	A128-AB-ERL35	TERMINAL ANCHOR
20	A250-PAN-1X2	WIREWAY
21	A250-PAN-1X2C	WIREWAY COVER
22	A209-AB-2	DIN RAIL
23	A124-AB-J3	SINGLE TERMINAL
24	A183-AB-7	RELAY SPST 120 VAC COIL
25	A184-AB-2	RELAY BASE

TOLERANCES EXCEPT AS NOTED	*THE LOVESHAW CORPORATION* RT 296, SOUTH CANAAN, PA.		
DECIMAL (3 PLC) +/- .005	TITLE: ELECTRICAL PANEL ASSEMBLY CF25T-120/1/60		
FRACTIONAL +/- 1/64	DWG. NO. ED2147		SCALE: 1 : 2
	MATERIAL: COMMERCIAL		DATE:03/30/10
ANG. - 1/2°	DESIGNED: MENTA	DRAWN: WM	APPRVD: --


CHAIN LUG DRIVE OVERLOAD RELAY
MAIN DRIVE MOTOR 1/3 HP NEMA 56C 1800 RPM
GUARD DOORS INTERLOCK SWITCHES
EMERGENCY STOP PB
BOX JAM RELAY
MASTER CONTACTOR 105, 113, 114, 212
AIR DUMP SOLENOID VALVE
MACHINE RUNNING INDICATOR LIGHT
PLC AC INPUT POWER
24VDC POWER SUPPLY FOR PLC INPUT DEVICES
SO CORD 300V
INCOMING POWER 120/1/60 HZ 10 AMPS
MICROLOGIX PLC INCOMING SUPPLY POWER 120VAC
MICROLOGIX PLC INTERNAL 24VDC POWER SUPPLY
CONTINUED TO SHEET 2, LINE 200
CONTINUED TO SHEET 3, LINE 306
CONTINUED TO SHEET 3 LINE 306
WIRE CONNECTION KEY
100 TERMINAL BLOCK LOCATED ON TERMINAL STRIP.
100 WIRE CONNECTION ON ELECTRICAL COMPONENT.
WIRING NOTES:
1. WIRE COLORS ARE AS NOTED.
2. AC CONTROL WIRE MIN. 18 AWG.
3. DC CONTROL WIRE MIN 20 AWG.
4. MOTOR WIRE MIN. 16 AWG.
THE LOVESHAW CORPORATION
RT 296, SOUTH CANAAN, PA.
TOLERANCES EXCEPT AS NOTED
DECIMAL (3 PLC) +/- .005
FRACTIONAL +/- 1/64
ANG. - 1/2°
TITLE: ELECTRICAL SCHEMATIC - SHEET 1
CF25T - 120/1/60
DWG. NO. ED2150S1
SCALE: N/A
MATERIAL: N/A
DATE: 04/05/10
DESIGNED: MENTA
DRAWN: WM
APPRVD: --



WIRE CONNECTION KEY

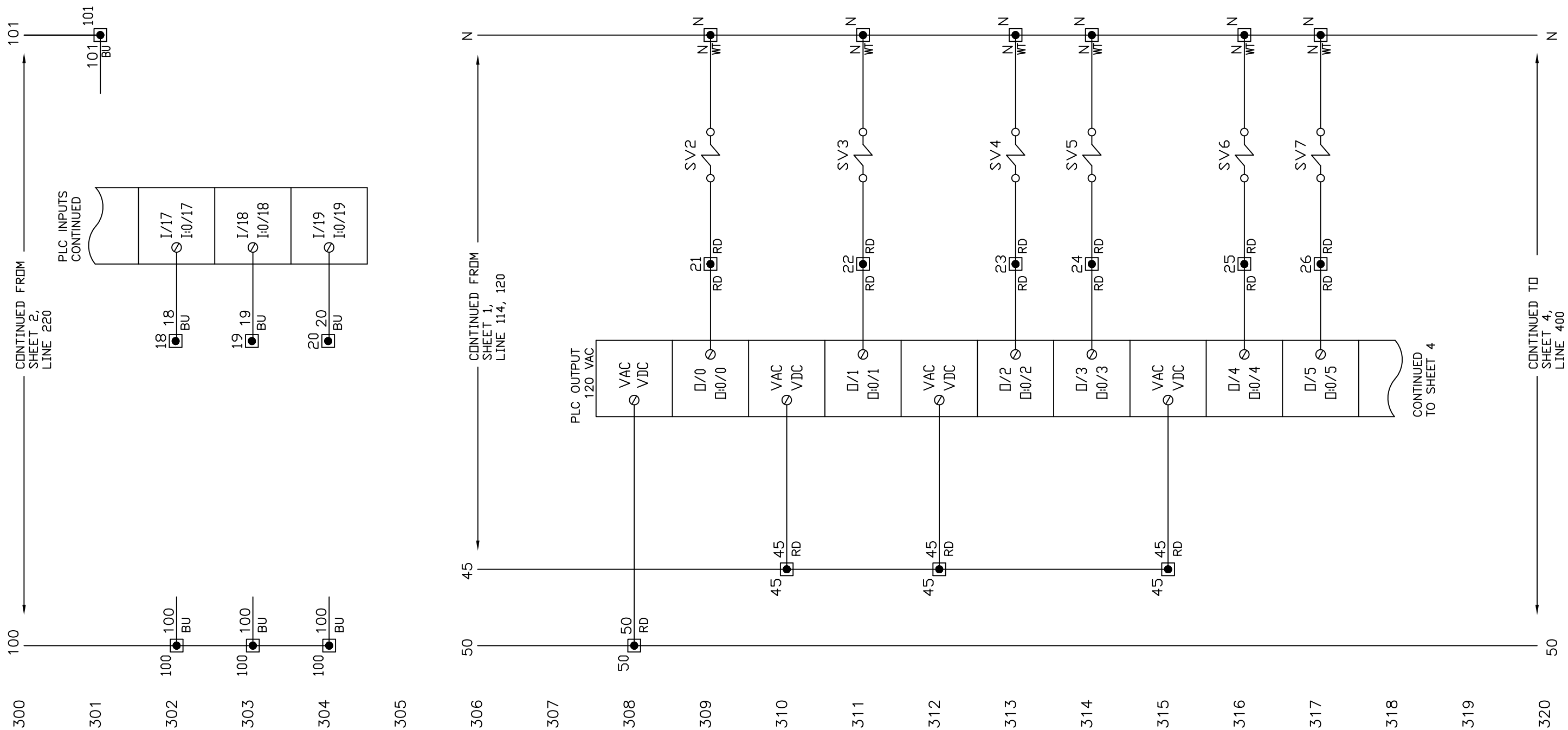
100 ● TERMINAL BLOCK LOCATED ON TERMINAL STRIP.

100 ○ WIRE CONNECTION ON ELECTRICAL COMPONENT.

WIRING NOTES:

1. WIRE COLORS ARE AS NOTED.
2. AC CONTROL WIRE MIN. 18 AWG.
3. DC CONTROL WIRE MIN 20 AWG.
4. MOTOR WIRE MIN. 16 AWG.

TOLERANCES EXCEPT AS NOTED	*THE LOVESHAW CORPORATION* RT 296, SOUTH CANAAN, PA.		
DECIMAL (3 PLC) +/– .005	TITLE: ELECTRICAL SCHEMATIC – SHEET 2 CF25T – 120/1/60		
FRACTIONAL +/– 1/64	DWG. NO. ED2150S2		SCALE: N/A
	MATERIAL: N/A		DATE: 04/05/10
ANG. – 1/2°	DESIGNED: MENTA	DRAWN: WM	APPRVD: ––



WIRE CONNECTION KEY

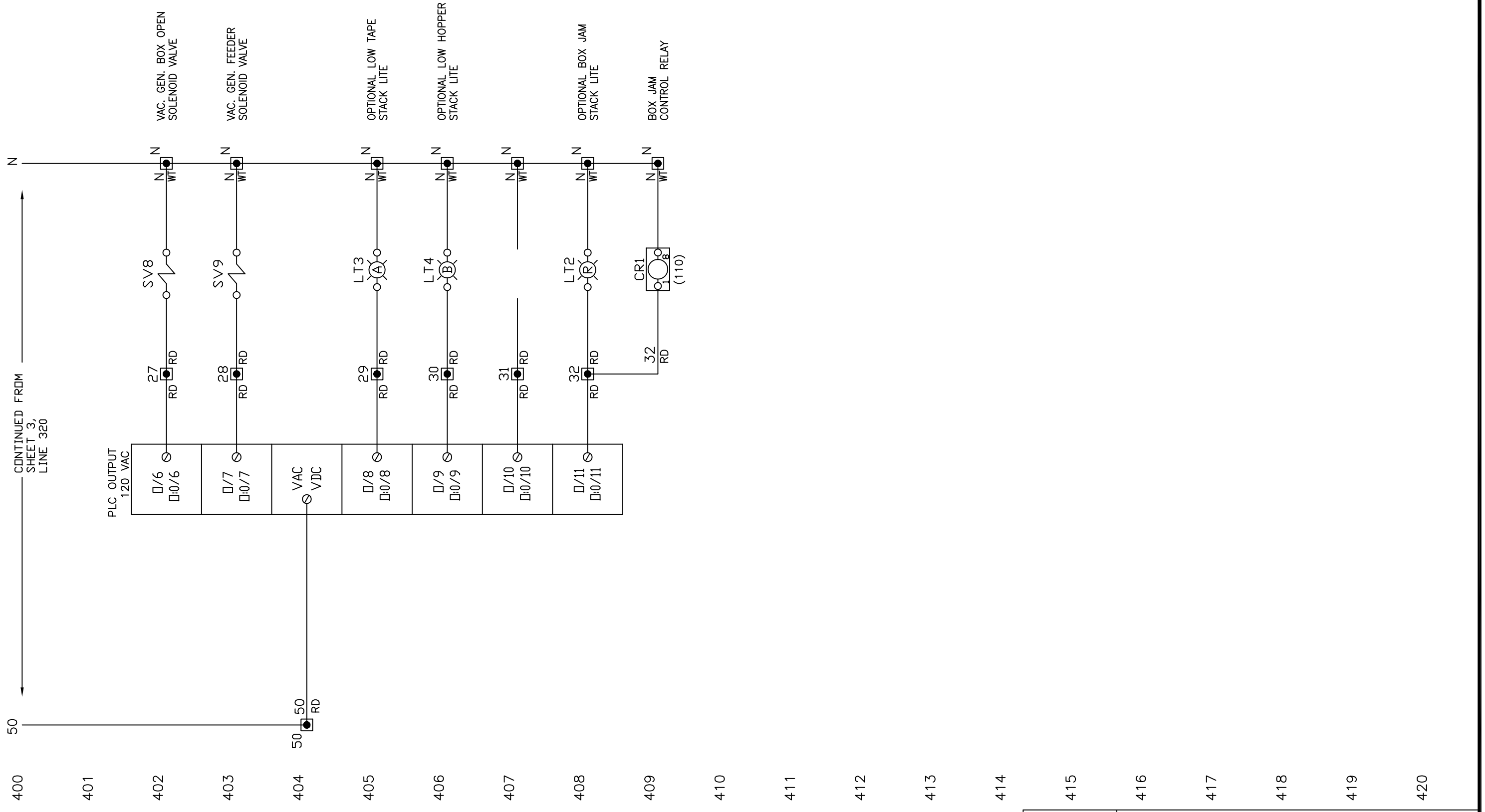
100 ● TERMINAL BLOCK LOCATED ON TERMINAL STRIP.

100 ○ WIRE CONNECTION ON ELECTRICAL COMPONENT.

WIRING NOTES:

1. WIRE COLORS ARE AS NOTED.
2. AC CONTROL WIRE MIN. 18 AWG.
3. DC CONTROL WIRE MIN 20 AWG.
4. MOTOR WIRE MIN. 16 AWG.

TOLERANCES EXCEPT AS NOTED	*THE LOVESHAW CORPORATION* RT 296, SOUTH CANAAN, PA.		
DECIMAL (3 PLC) +/– .005	TITLE: ELECTRICAL SCHEMATIC – SHEET 3 CF25T – 120/1/60		
FRACTIONAL +/– 1/64	DWG. NO. ED2150S3		SCALE: N/A
	MATERIAL: N/A		DATE: 04/05/10
ANG. – 1/2°	DESIGNED: MENTA	DRAWN: WM	APPRVD: ––



WIRE CONNECTION KEY

100 ● TERMINAL BLOCK LOCATED ON TERMINAL STRIP.

100 ○ WIRE CONNECTION ON ELECTRICAL COMPONENT.

WIRING NOTES:

1. WIRE COLORS ARE AS NOTED.
2. AC CONTROL WIRE MIN. 18 AWG.
3. DC CONTROL WIRE MIN 20 AWG.
4. MOTOR WIRE MIN. 16 AWG.

TOLERANCES EXCEPT AS NOTED	*THE LOVESHAW CORPORATION* RT 296, SOUTH CANAAN, PA.		
DECIMAL (3 PLC) +/– .005	TITLE: ELECTRICAL SCHEMATIC – SHEET 4 CF25T – 120/1/60		
FRACTIONAL +/– 1/64	DWG. NO. ED2150S4		SCALE: N/A
	MATERIAL: N/A		DATE: 04/05/10
ANG. – 1/2°	DESIGNED: MENTA	DRAWN: WM	APPRVD: ––

OPTIONAL SENSOR PART NUMBERS

BOX JAM DETECTION

SENSOR P/N: A219-PF-8

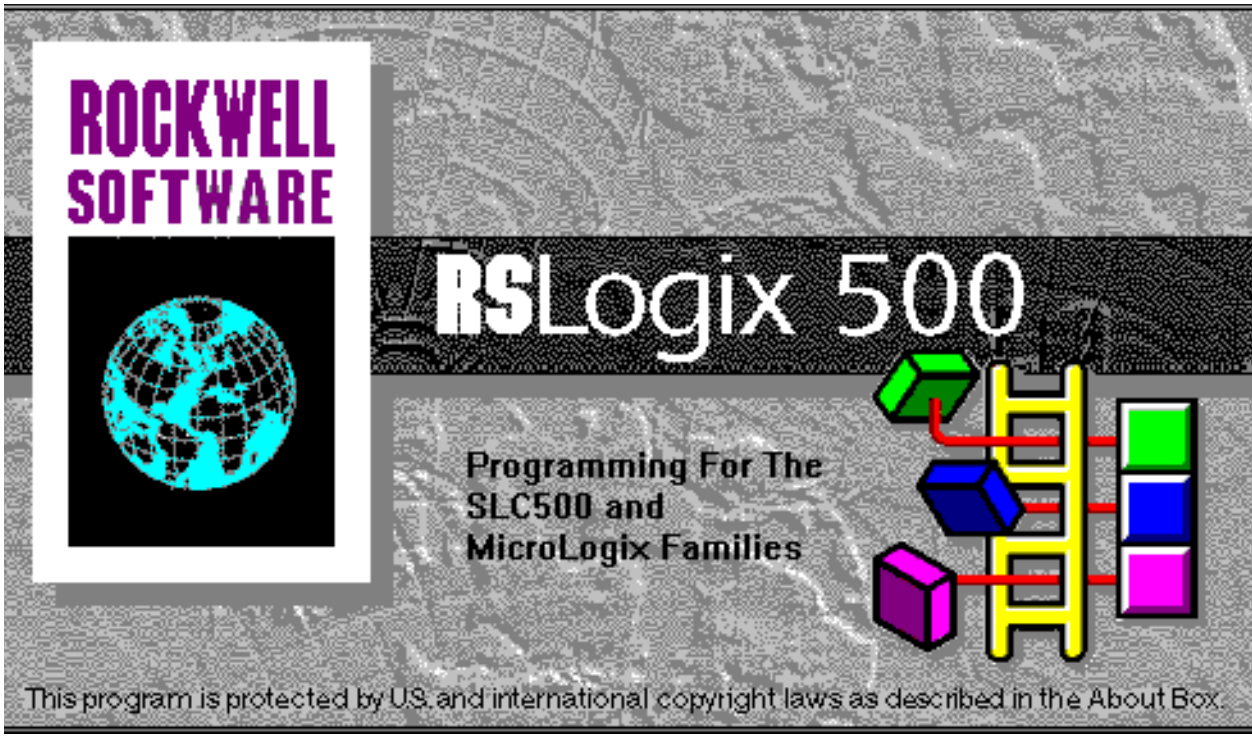
LOW TAPE DETECTION

SENSOR P/N: 303527

LOW HOPPER DETECTION

SENSOR P/N: 302575

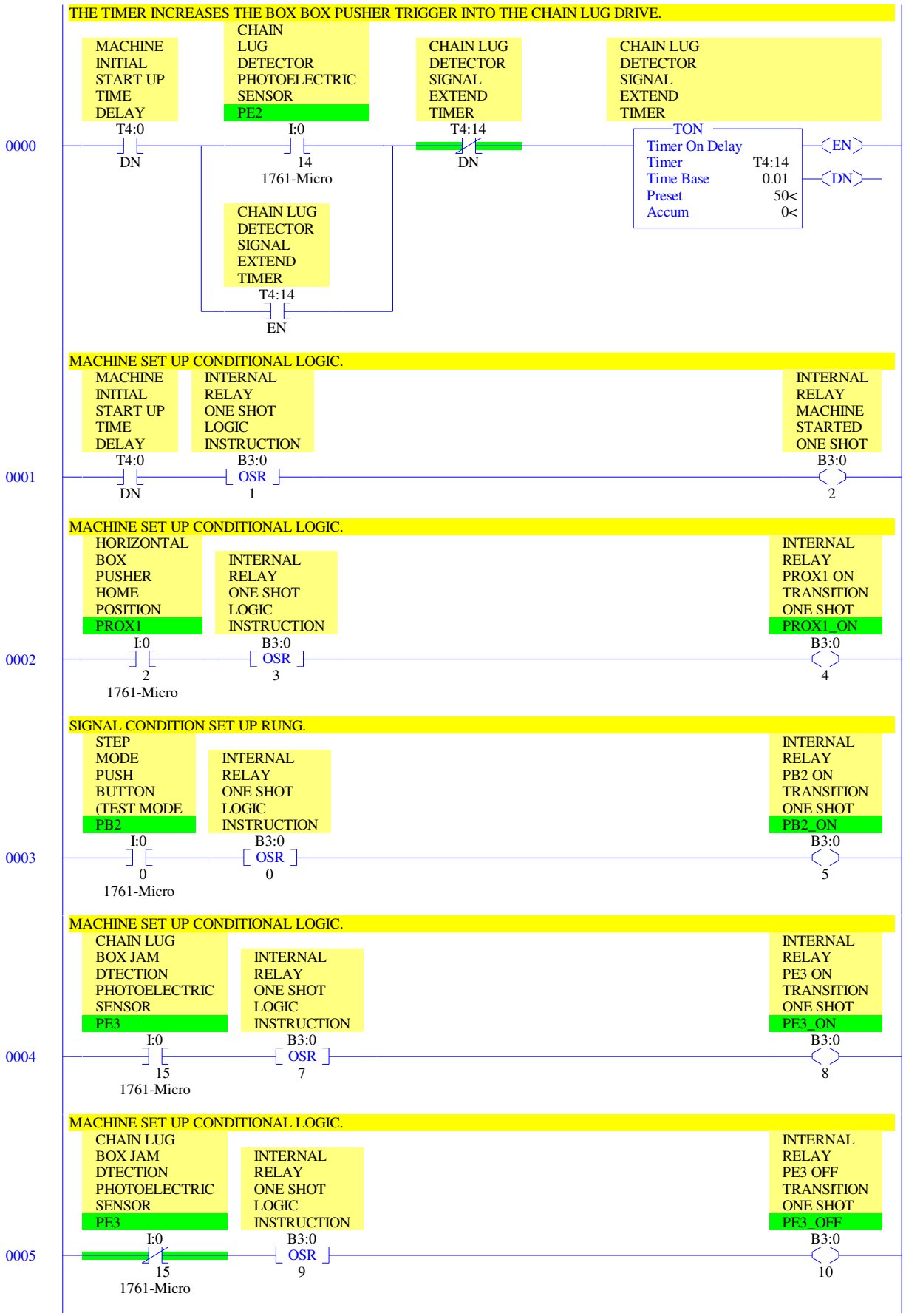
CF25T LADDER LOGIC

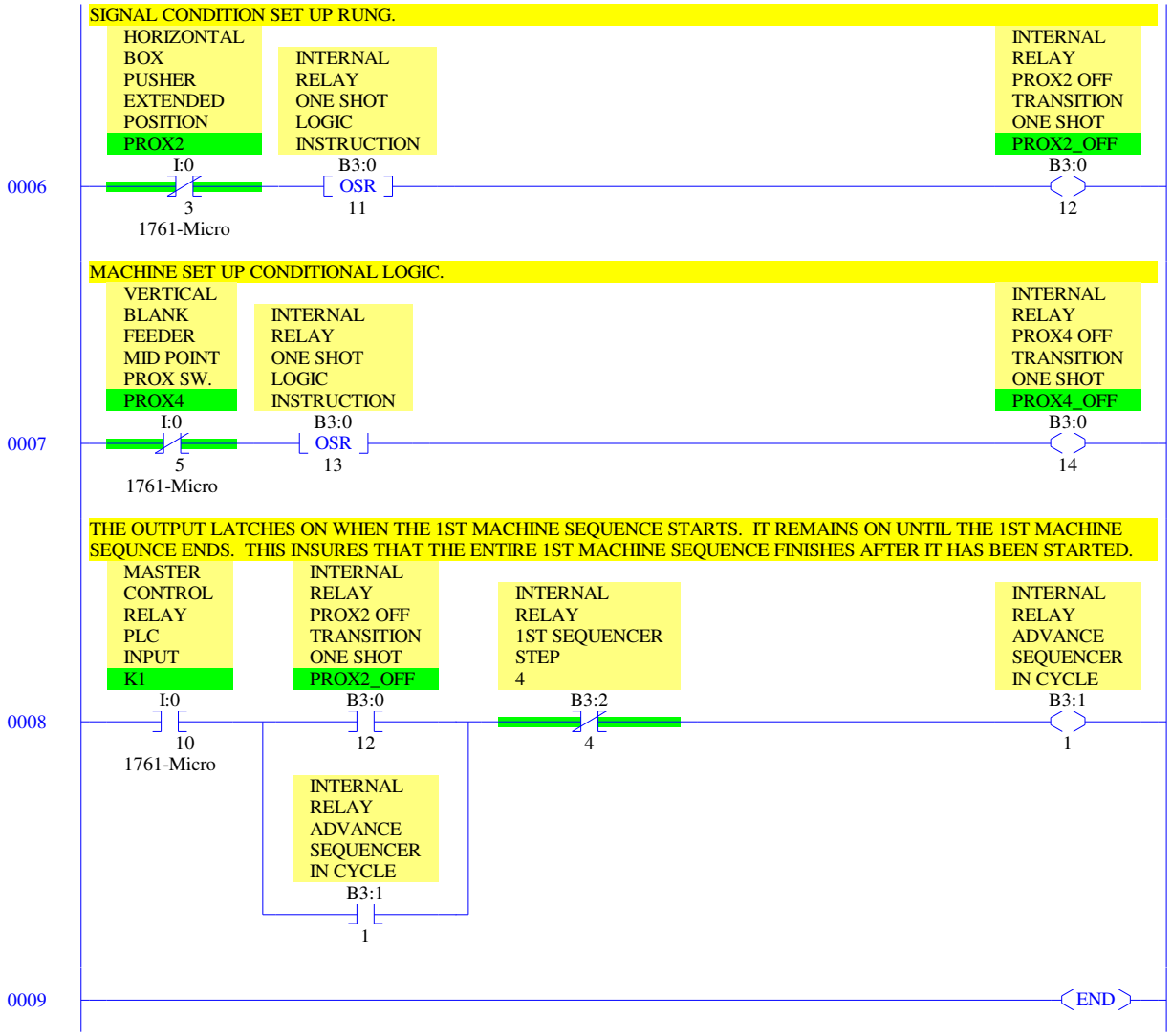


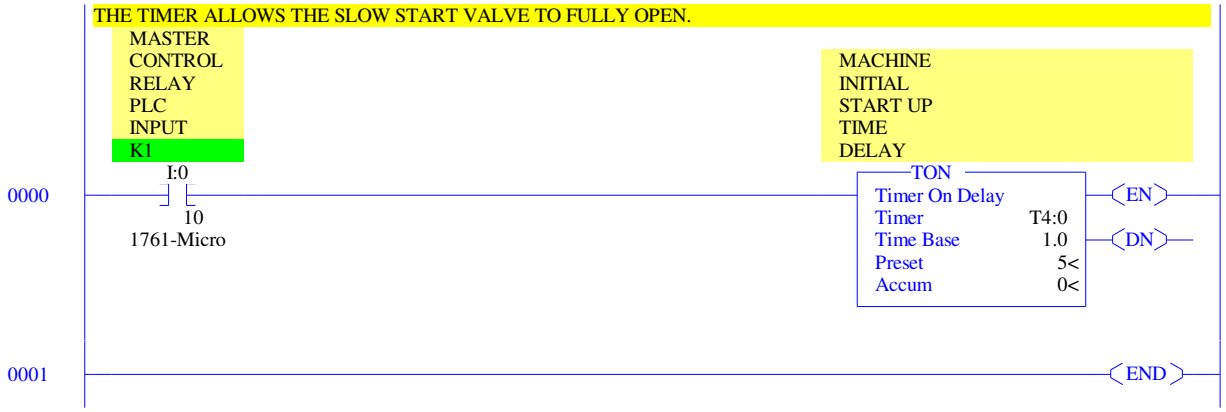
Program File List

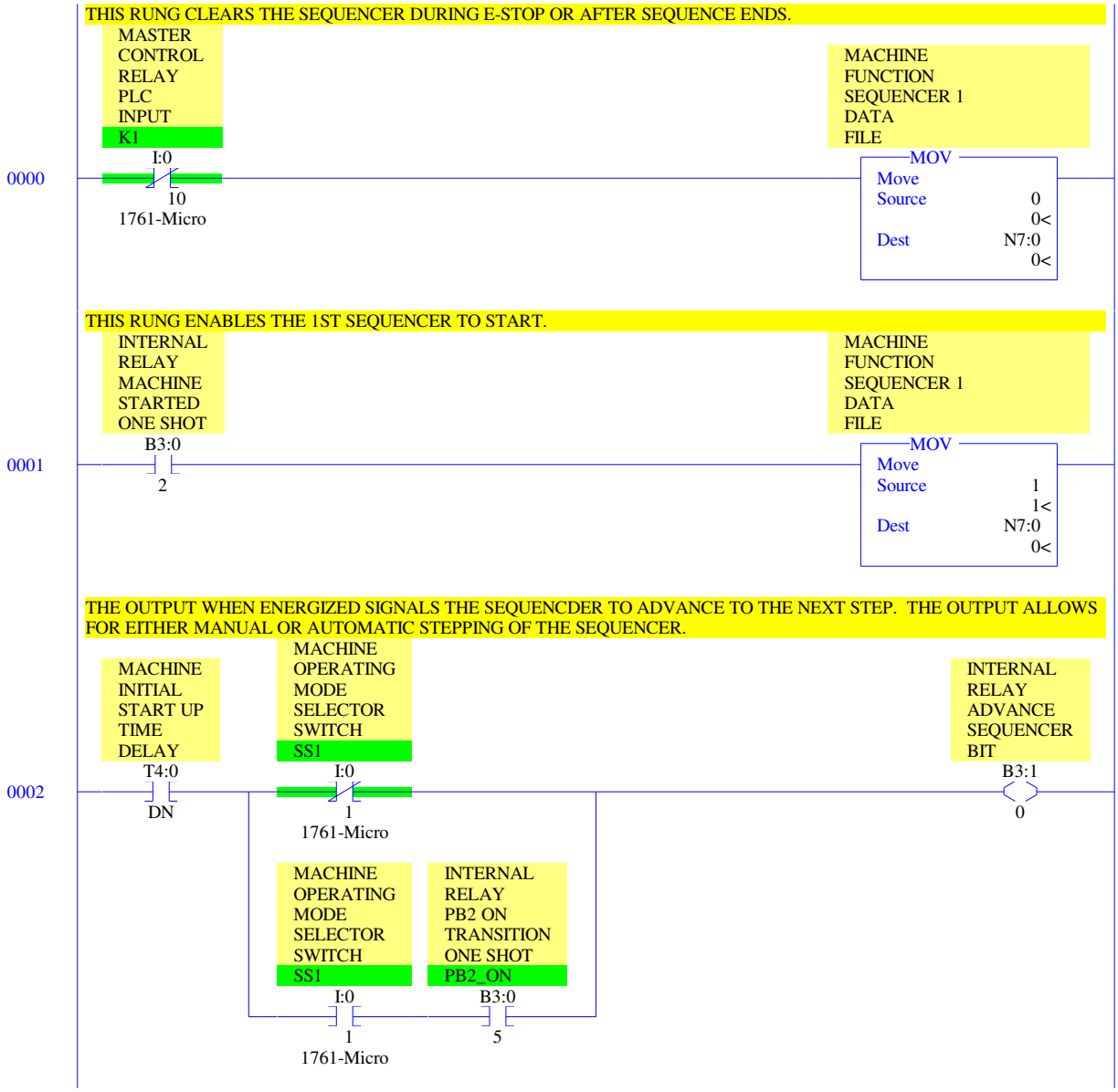
Name	Number	Type	Rungs	Debug	Bytes
[SYSTEM]	0	SYS	0	No	0
	1	SYS	0	No	0
SUBROUTINE	2	LADDER	7	No	57
SET UP	3	LADDER	10	No	250
MACH START	4	LADDER	2	No	19
1ST SEQ'N	5	LADDER	13	No	789
OUTPUTS	6	LADDER	11	No	300
HOPPER	7	LADDER	7	No	134
STATUS	8	LADDER	9	No	304
	9	LADDER	1	No	3
	10	LADDER	1	No	3
	11	LADDER	1	No	3
	12	LADDER	1	No	3
	13	LADDER	1	No	3
	14	LADDER	1	No	3
	15	LADDER	1	No	3
	16	LADDER	1	Yes	3

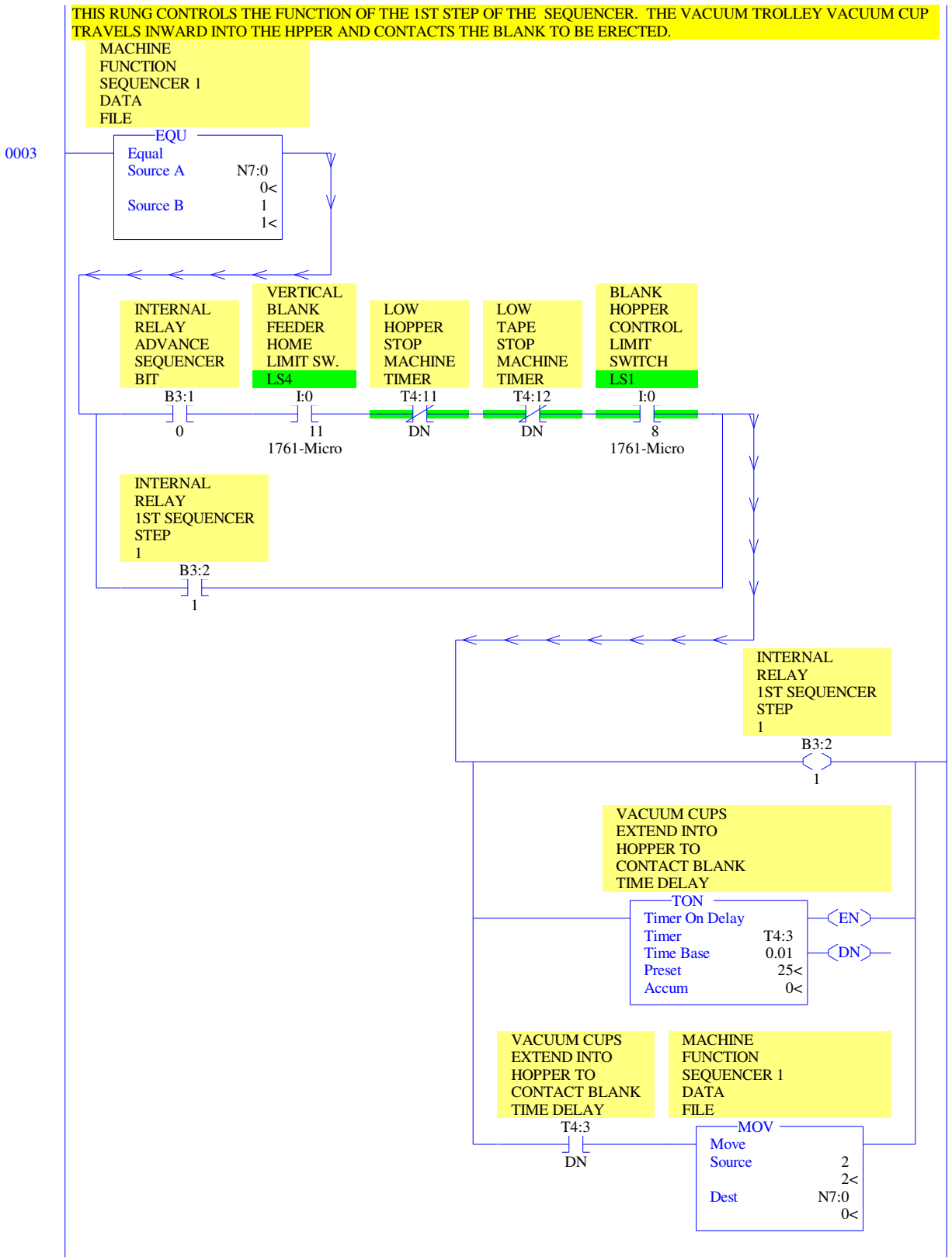
LAD 2 - SUBROUTINE --- Total Rungs in File = 7


THE TIMER INCREASES THE BOX BOX PUSHER TRIGGER INTO THE CHAIN LUG DRIVE.
MACHINE INITIAL START UP TIME DELAY
T4:0
DN
CHAIN LUG DETECTOR PHOTOELECTRIC SENSOR
PE2
I:0
14
1761-Micro
CHAIN LUG DETECTOR SIGNAL EXTEND TIMER
T4:14
DN
CHAIN LUG DETECTOR SIGNAL EXTEND TIMER
TON
Timer On Delay
Timer T4:14
Time Base 0.01
Preset 50<
Accum 0<
EN
DN
CHAIN LUG DETECTOR SIGNAL EXTEND TIMER
T4:14
EN
0000
MACHINE SET UP CONDITIONAL LOGIC.
MACHINE INITIAL START UP TIME DELAY
T4:0
DN
INTERNAL RELAY ONE SHOT LOGIC INSTRUCTION
B3:0
OSR
1
INTERNAL RELAY MACHINE STARTED ONE SHOT
B3:0
2
0001
MACHINE SET UP CONDITIONAL LOGIC.
HORIZONTAL BOX PUSHER HOME POSITION
PROX1
I:0
2
1761-Micro
INTERNAL RELAY ONE SHOT LOGIC INSTRUCTION
B3:0
OSR
3
INTERNAL RELAY PROX1 ON TRANSITION ONE SHOT
PROX1_ON
B3:0
4
0002
SIGNAL CONDITION SET UP RUNG.
STEP MODE PUSH BUTTON (TEST MODE
PB2
I:0
0
1761-Micro
INTERNAL RELAY ONE SHOT LOGIC INSTRUCTION
B3:0
OSR
0
INTERNAL RELAY PB2 ON TRANSITION ONE SHOT
PB2_ON
B3:0
5
0003
MACHINE SET UP CONDITIONAL LOGIC.
CHAIN LUG BOX JAM DTECTION PHOTOELECTRIC SENSOR
PE3
I:0
15
1761-Micro
INTERNAL RELAY ONE SHOT LOGIC INSTRUCTION
B3:0
OSR
7
INTERNAL RELAY PE3 ON TRANSITION ONE SHOT
PE3_ON
B3:0
8
0004
MACHINE SET UP CONDITIONAL LOGIC.
CHAIN LUG BOX JAM DTECTION PHOTOELECTRIC SENSOR
PE3
I:0
15
1761-Micro
INTERNAL RELAY ONE SHOT LOGIC INSTRUCTION
B3:0
OSR
9
INTERNAL RELAY PE3 OFF TRANSITION ONE SHOT
PE3_OFF
B3:0
10
0005


SIGNAL CONDITION SET UP RUNG.
HORIZONTAL BOX PUSHER EXTENDED POSITION PROX2
I:0
3
1761-Micro
INTERNAL RELAY ONE SHOT LOGIC INSTRUCTION
B3:0
OSR
11
INTERNAL RELAY PROX2 OFF TRANSITION ONE SHOT PROX2_OFF
B3:0
12
0006
MACHINE SET UP CONDITIONAL LOGIC.
VERTICAL BLANK FEEDER MID POINT PROX SW. PROX4
I:0
5
1761-Micro
INTERNAL RELAY ONE SHOT LOGIC INSTRUCTION
B3:0
OSR
13
INTERNAL RELAY PROX4 OFF TRANSITION ONE SHOT PROX4_OFF
B3:0
14
0007
THE OUTPUT LATCHES ON WHEN THE 1ST MACHINE SEQUENCE STARTS. IT REMAINS ON UNTIL THE 1ST MACHINE SEQUNCE ENDS. THIS INSURES THAT THE ENTIRE 1ST MACHINE SEQUENCE FINISHES AFTER IT HAS BEEN STARTED.
MASTER CONTROL RELAY PLC INPUT K1
I:0
10
1761-Micro
INTERNAL RELAY PROX2 OFF TRANSITION ONE SHOT PROX2_OFF
B3:0
12
INTERNAL RELAY 1ST SEQUENCER STEP 4
B3:2
4
INTERNAL RELAY ADVANCE SEQUENCER IN CYCLE
B3:1
1
INTERNAL RELAY ADVANCE SEQUENCER IN CYCLE
B3:1
1
0008
0009
END

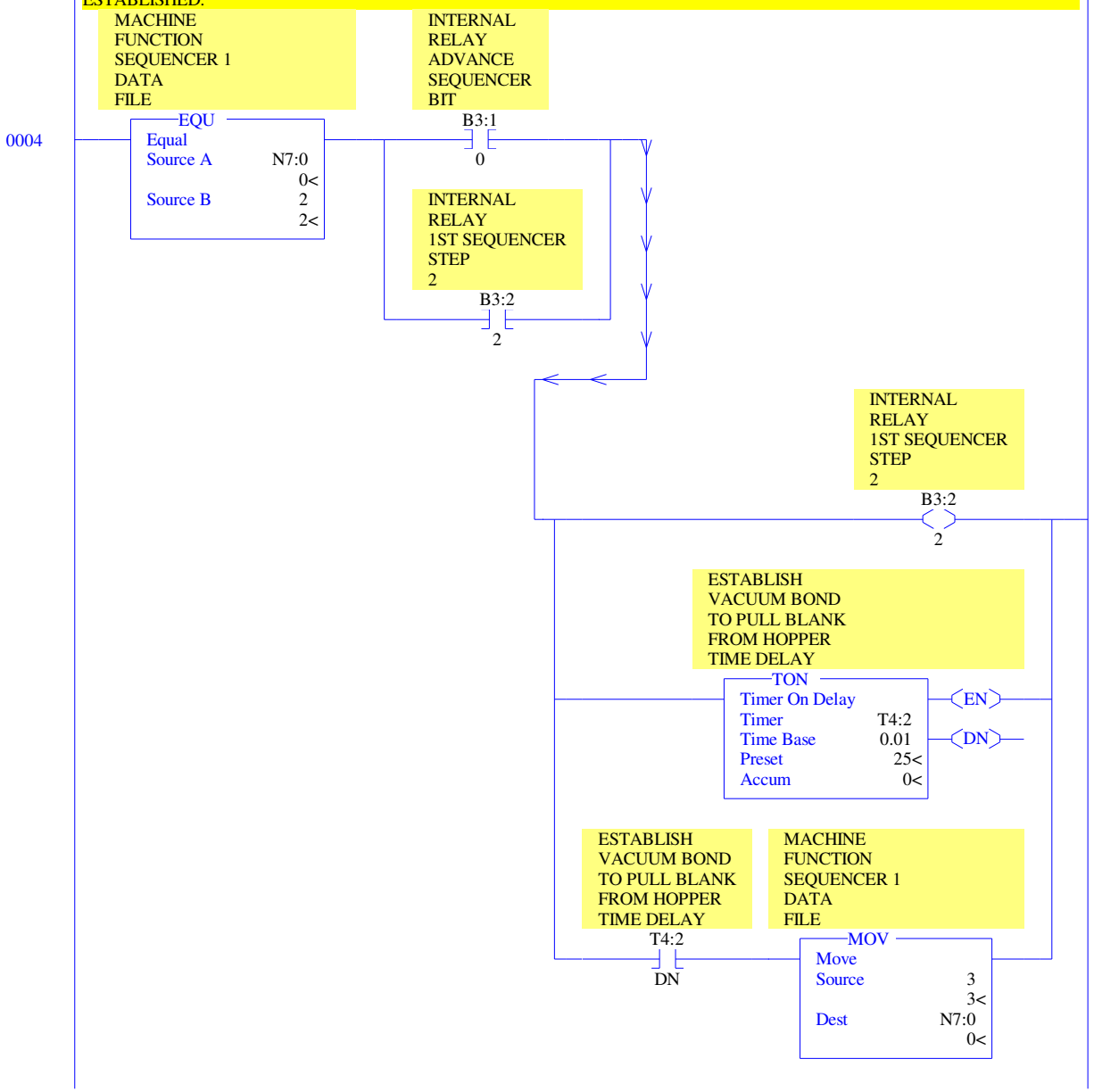

THE TIMER ALLOWS THE SLOW START VALVE TO FULLY OPEN.
MASTER
CONTROL
RELAY
PLC
INPUT
K1
I:0
10
1761-Micro
MACHINE
INITIAL
START UP
TIME
DELAY
TON
Timer On Delay
Timer T4:0
Time Base 1.0
Preset 5<
Accum 0<
EN
DN
0000
0001
END


THIS RUNG CLEARS THE SEQUENCER DURING E-STOP OR AFTER SEQUENCE ENDS.
MASTER CONTROL RELAY PLC INPUT
K1
I:0
10
1761-Micro
MACHINE FUNCTION SEQUENCER 1 DATA FILE
MOV
Move
Source 0
0<
Dest N7:0
0<
0000
THIS RUNG ENABLES THE 1ST SEQUENCER TO START.
INTERNAL RELAY MACHINE STARTED ONE SHOT
B3:0
2
MACHINE FUNCTION SEQUENCER 1 DATA FILE
MOV
Move
Source 1
1<
Dest N7:0
0<
0001
THE OUTPUT WHEN ENERGIZED SIGNALS THE SEQUENCDER TO ADVANCE TO THE NEXT STEP. THE OUTPUT ALLOWS FOR EITHER MANUAL OR AUTOMATIC STEPPING OF THE SEQUENCER.
MACHINE INITIAL START UP TIME DELAY
T4:0
DN
MACHINE OPERATING MODE SELECTOR SWITCH
SS1
I:0
1
1761-Micro
INTERNAL RELAY ADVANCE SEQUENCER BIT
B3:1
0
MACHINE OPERATING MODE SELECTOR SWITCH
SS1
I:0
1
1761-Micro
INTERNAL RELAY PB2 ON TRANSITION ONE SHOT
PB2_ON
B3:0
5
0002


THIS RUNG CONTROLS THE FUNCTION OF THE 1ST STEP OF THE SEQUENCER. THE VACUUM TROLLEY VACUUM CUP TRAVELS INWARD INTO THE HPPER AND CONTACTS THE BLANK TO BE ERECTED.
MACHINE FUNCTION SEQUENCER 1 DATA FILE
0003
EQU
Equal
Source A N7:0 0<
Source B 1 1<
INTERNAL RELAY ADVANCE SEQUENCER BIT
B3:1
0
VERTICAL BLANK FEEDER HOME LIMIT SW.
LS4
I:0
11
1761-Micro
LOW HOPPER STOP MACHINE TIMER
T4:11
DN
LOW TAPE STOP MACHINE TIMER
T4:12
DN
BLANK HOPPER CONTROL LIMIT SWITCH
LS1
I:0
8
1761-Micro
INTERNAL RELAY 1ST SEQUENCER STEP 1
B3:2
1
INTERNAL RELAY 1ST SEQUENCER STEP 1
B3:2
1
VACUUM CUPS EXTEND INTO HOPPER TO CONTACT BLANK TIME DELAY
TON
Timer On Delay
Timer T4:3
Time Base 0.01
Preset 25<
Accum 0<
EN
DN
VACUUM CUPS EXTEND INTO HOPPER TO CONTACT BLANK TIME DELAY
T4:3
DN
MACHINE FUNCTION SEQUENCER 1 DATA FILE
MOV
Move
Source 2 2<
Dest N7:0 0<

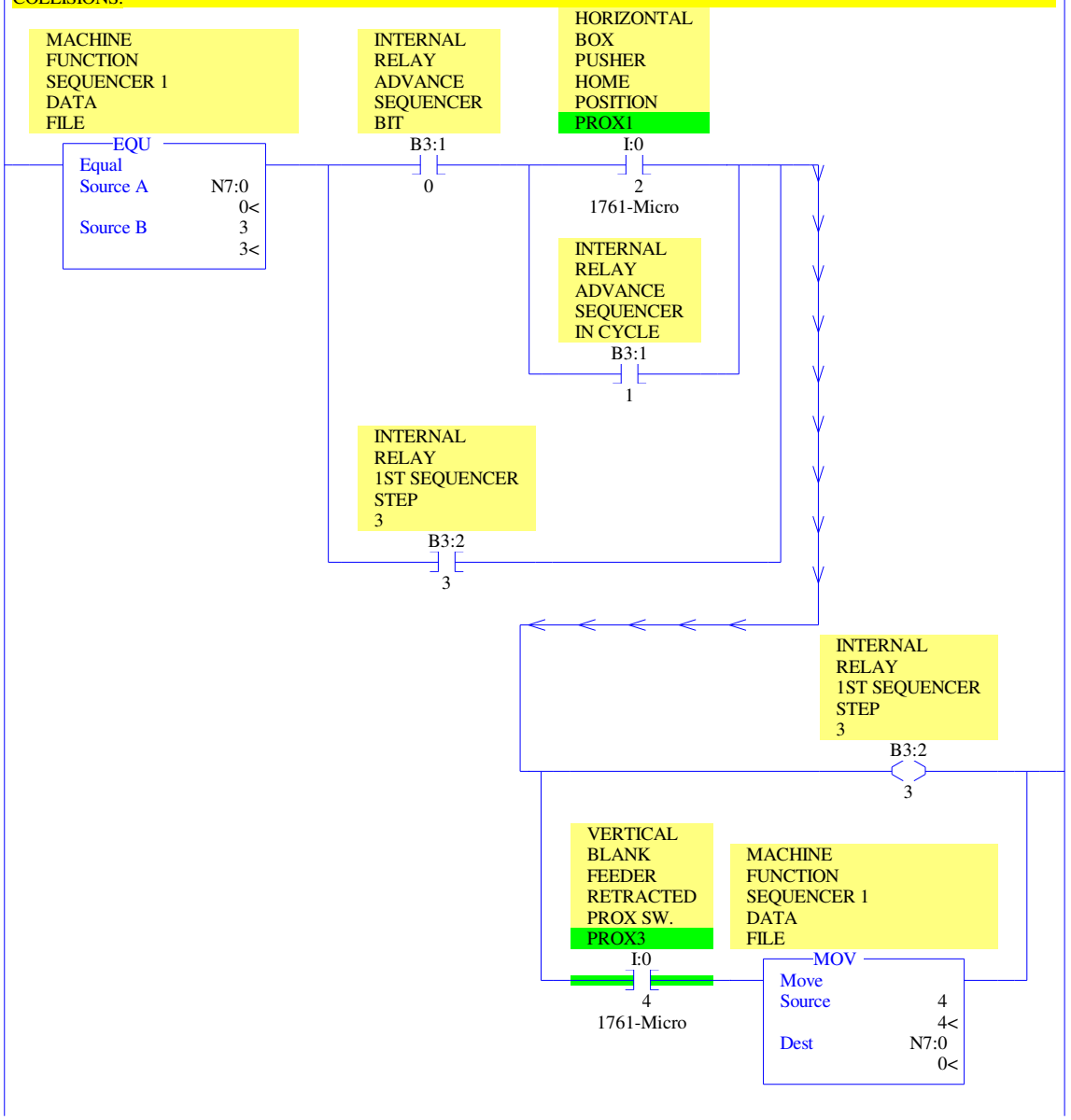
THIS RUNG CONTROLS THE FUNCTION OF THE 2ND STEP OF THE SEQUENCER.. THE VACUUM TROLLEY VACUUM CUP GRABS THE BLANK IN THE HOPPER AND PULLS IT OUT OF THE HOPPER. ONCE A SUITABLE VACUUM BOND IS ESTABLISHED.

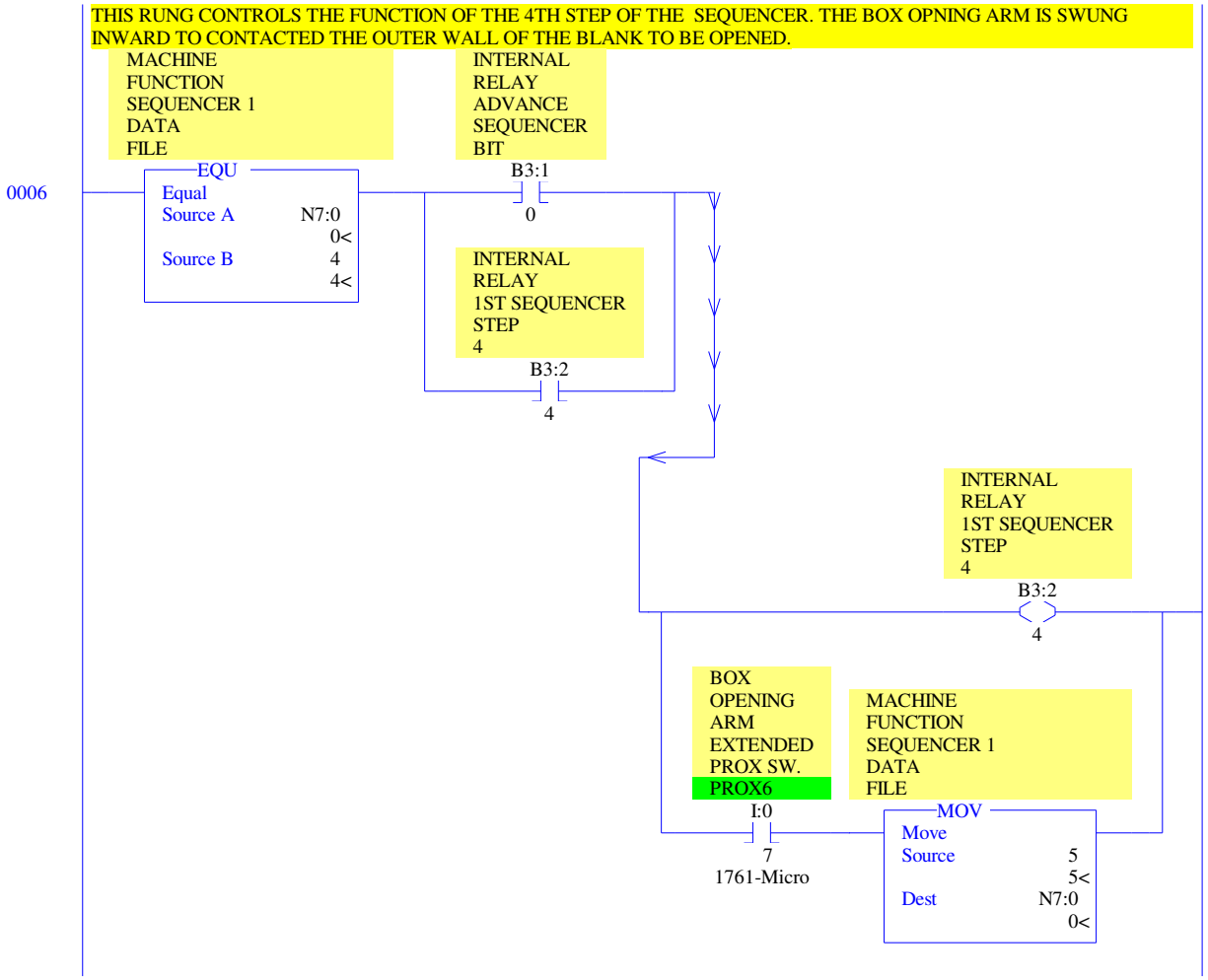
0004



THIS RUNG CONTROLS THE FUNCTION OF THE 3RD STEP OF THE SEQUENCER. THE VERTICAL BLANK FEEDER IS PULLING THE UNOPENED BLANK TOWARDS THE BLANK OPENING ARE OF THE ERECTOR. BIT B3:1/1 ALLOWS THE NEXT BLANK TO BE PULLED DOWN IMMEDIATELY WITHOUT HAVING TO WAIT FOR THE BOX PUSHER TO RETURN HOME. JAM PROTECTION MONITORS THE POSITION OF THE VERTICAL TROLLEY AND BOX PUSHER TO AVOID COLLISIONS.

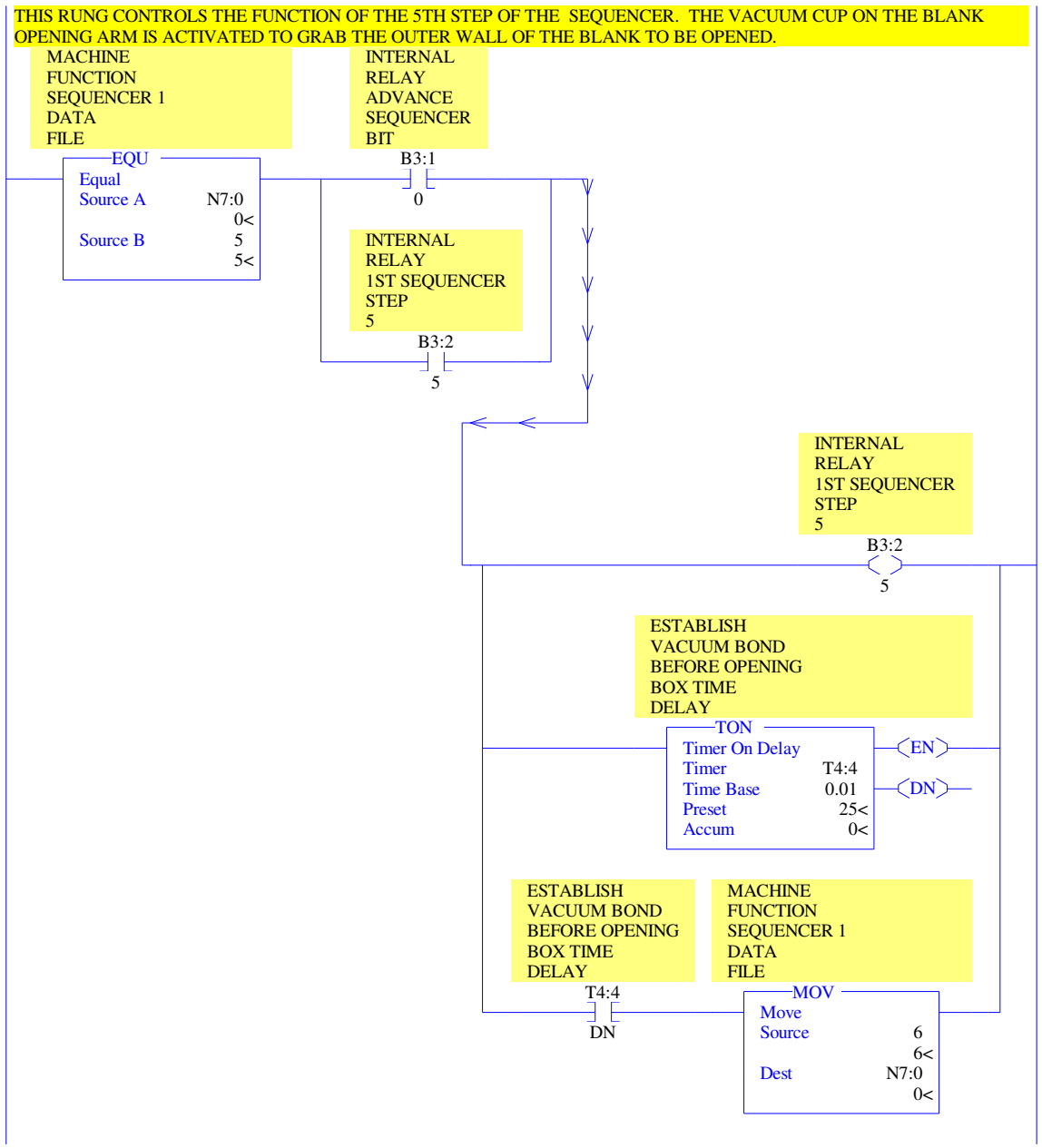
0005




THIS RUNG CONTROLS THE FUNCTION OF THE 4TH STEP OF THE SEQUENCER. THE BOX OPNING ARM IS SWUNG INWARD TO CONTACTED THE OUTER WALL OF THE BLANK TO BE OPENED.
0006
MACHINE FUNCTION SEQUENCER 1 DATA FILE
EQU
Equal
Source A N7:0 0<
Source B 4 4<
INTERNAL RELAY ADVANCE SEQUENCER BIT
B3:1
0
INTERNAL RELAY 1ST SEQUENCER STEP 4
B3:2
4
INTERNAL RELAY 1ST SEQUENCER STEP 4
B3:2
4
BOX OPENING ARM EXTENDED PROX SW. PROX6
I:0
7
1761-Micro
MACHINE FUNCTION SEQUENCER 1 DATA FILE
MOV
Move
Source 5 5<
Dest N7:0 0<

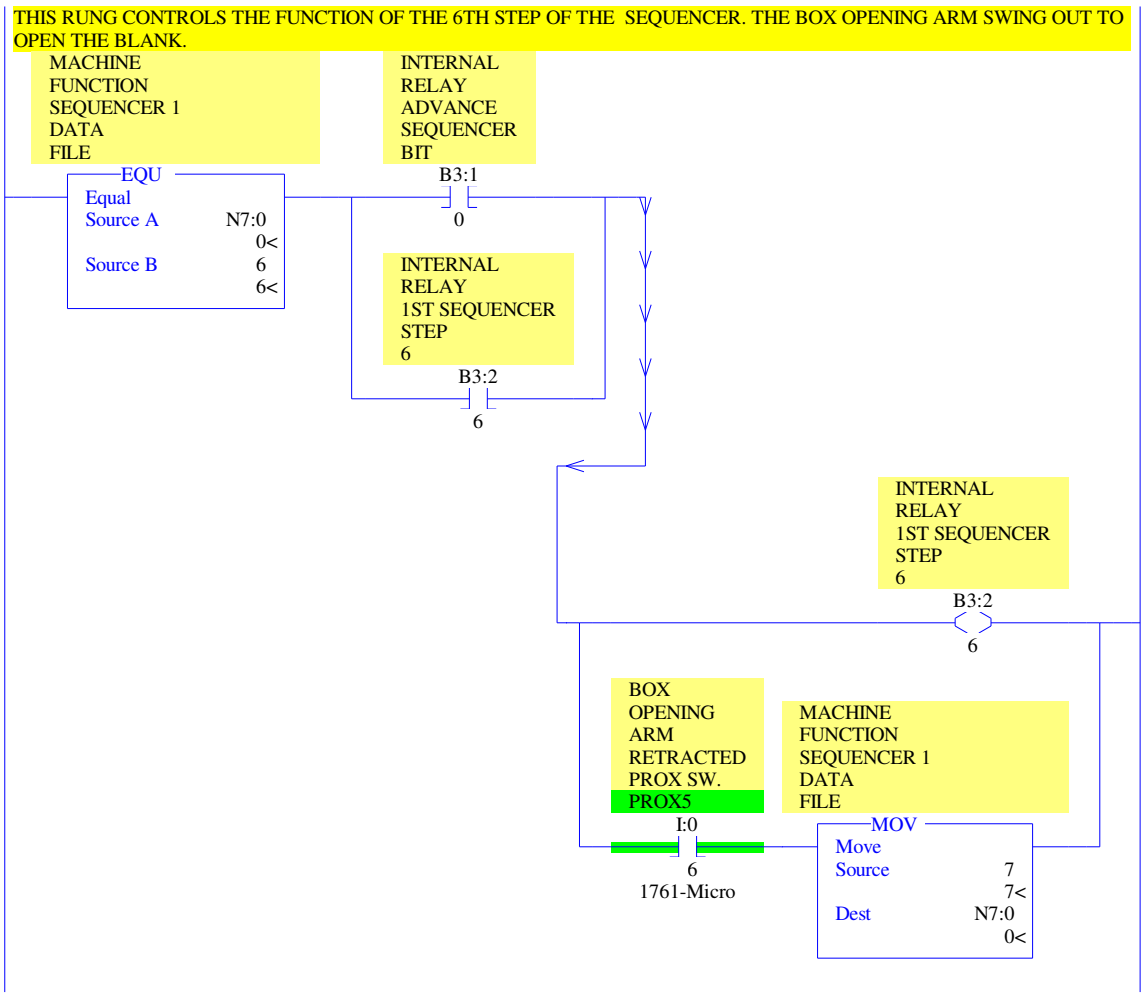
THIS RUNG CONTROLS THE FUNCTION OF THE 5TH STEP OF THE SEQUENCER. THE VACUUM CUP ON THE BLANK OPENING ARM IS ACTIVATED TO GRAB THE OUTER WALL OF THE BLANK TO BE OPENED.

0007



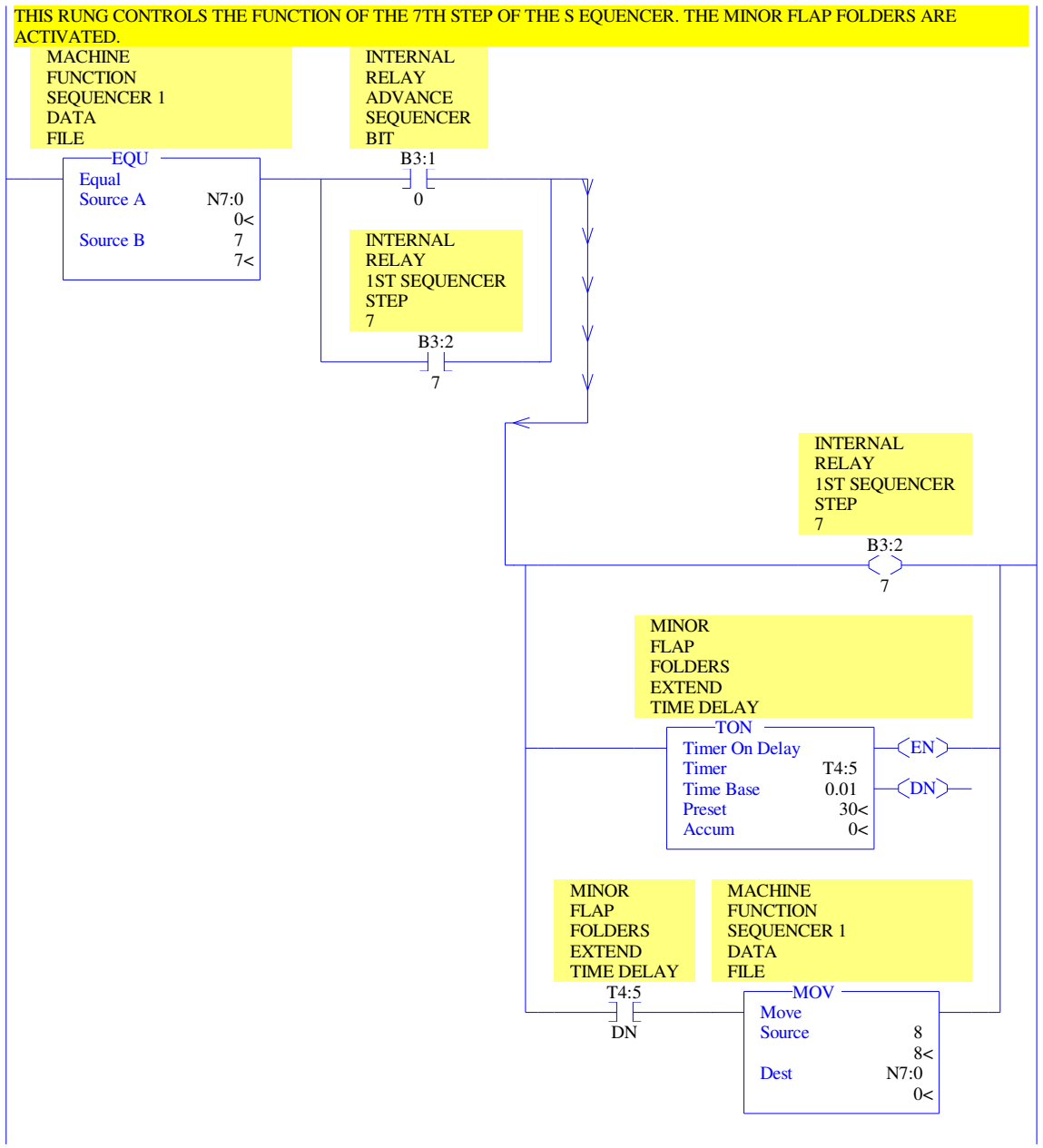
THIS RUNG CONTROLS THE FUNCTION OF THE 6TH STEP OF THE SEQUENCER. THE BOX OPENING ARM SWING OUT TO OPEN THE BLANK.

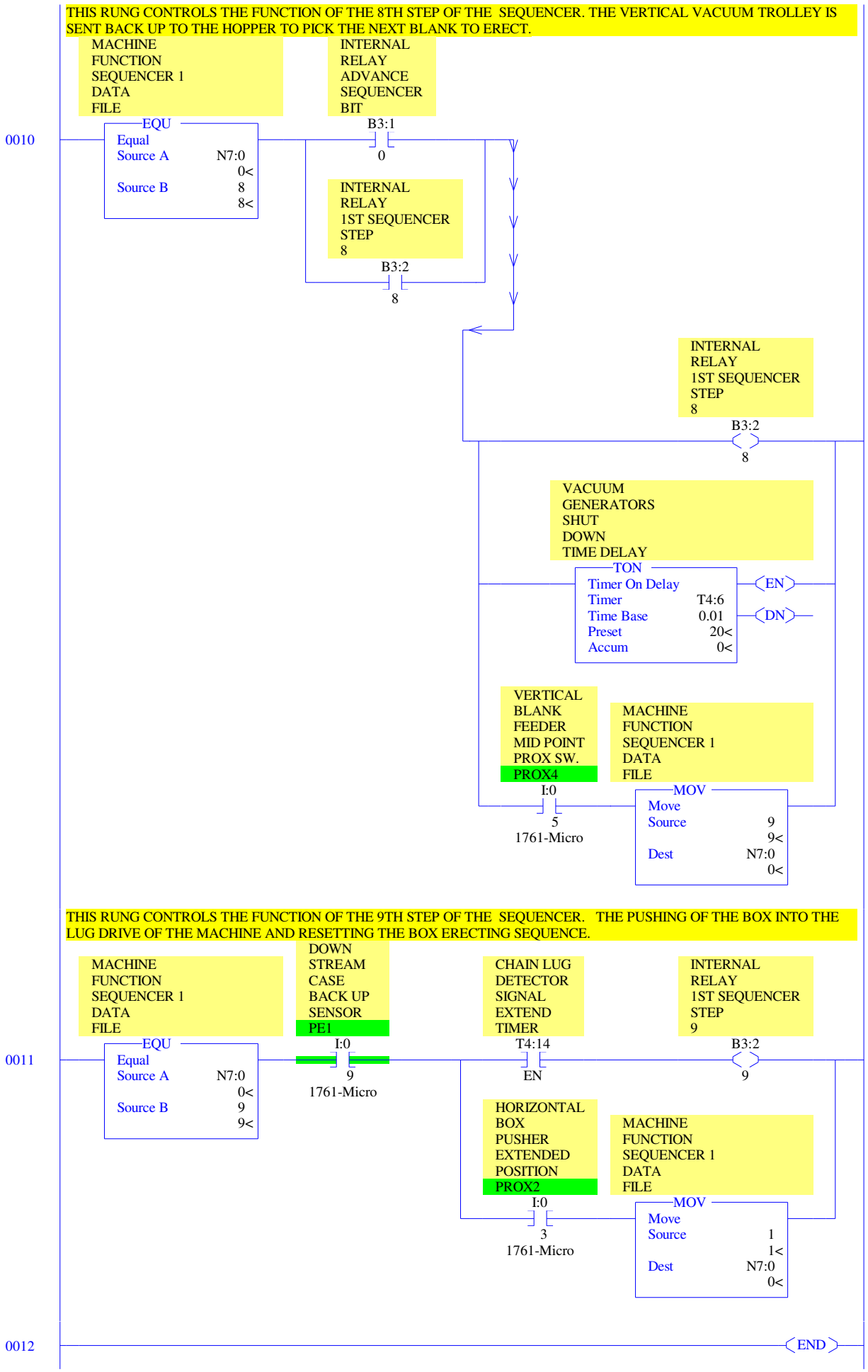
0008

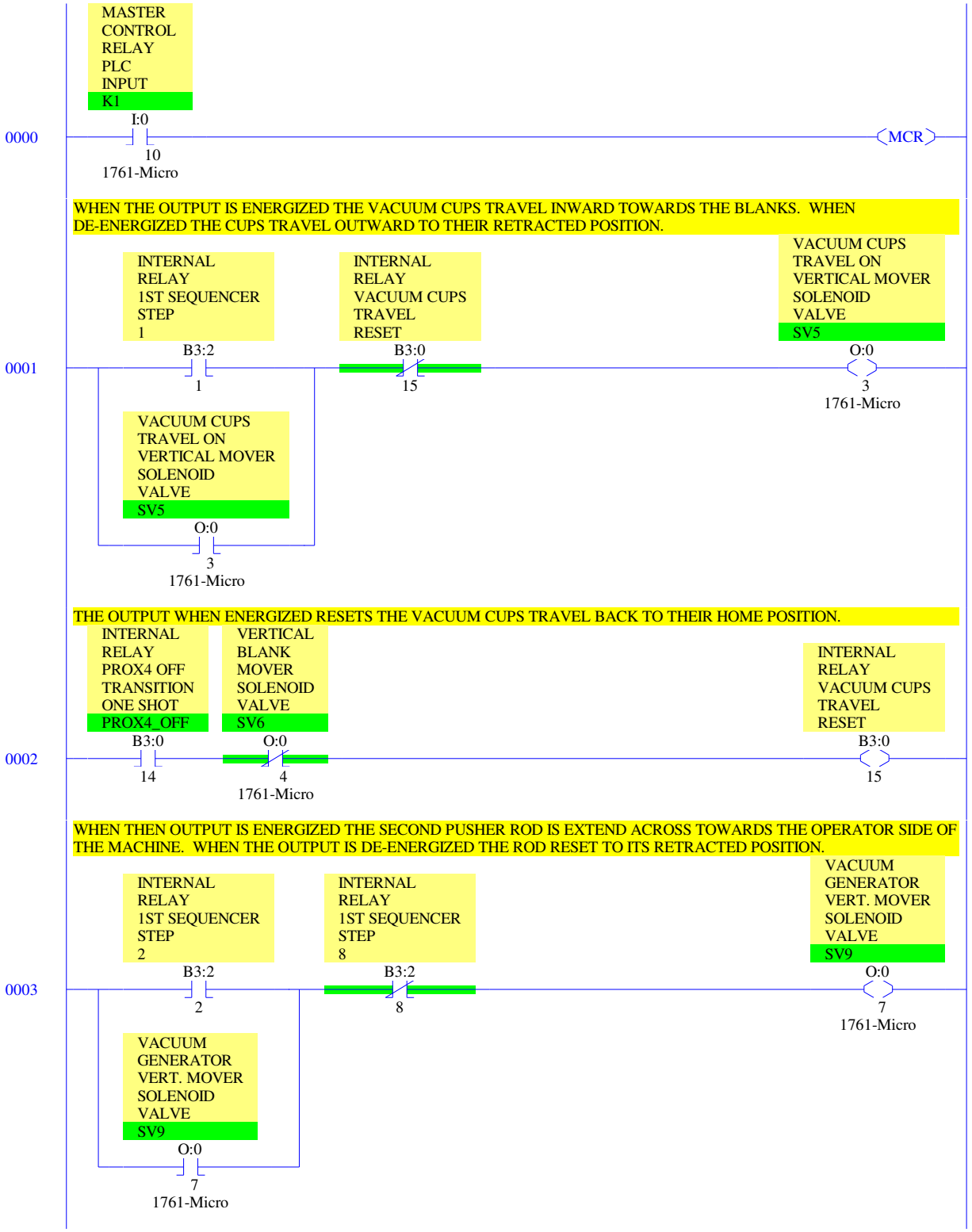


THIS RUNG CONTROLS THE FUNCTION OF THE 7TH STEP OF THE S EQUENCER. THE MINOR FLAP FOLDERS ARE ACTIVATED.

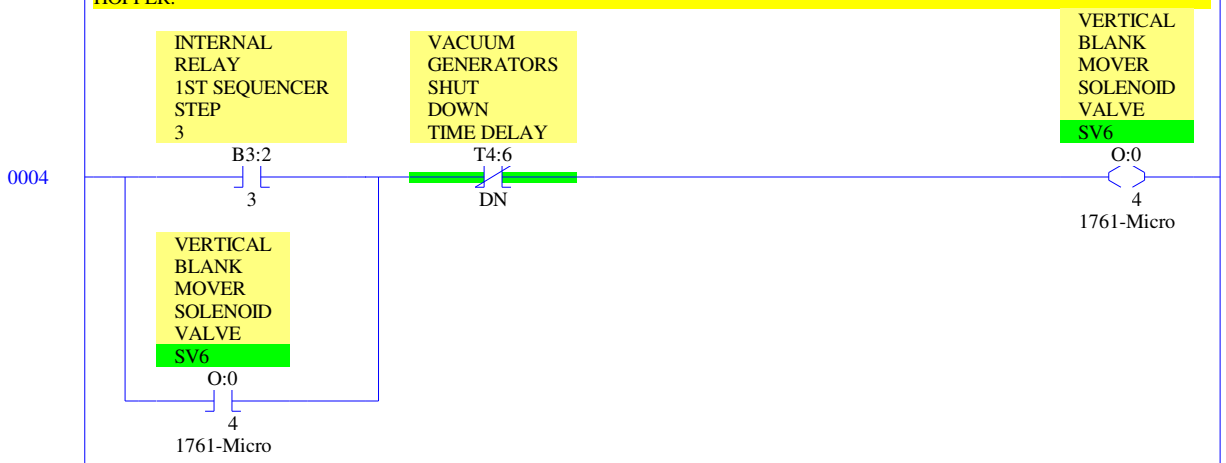
0009



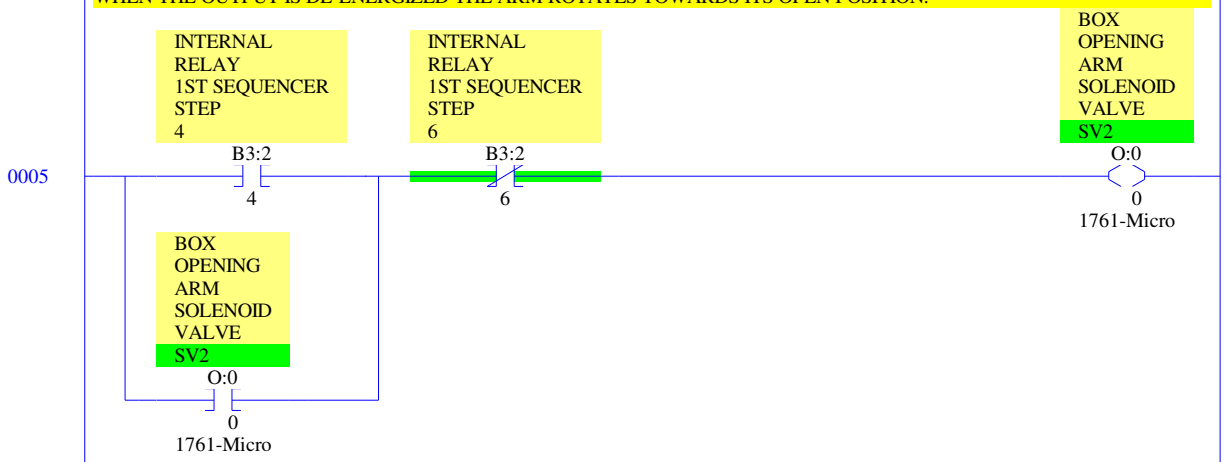

THIS RUNG CONTROLS THE FUNCTION OF THE 8TH STEP OF THE SEQUENCER. THE VERTICAL VACUUM TROLLEY IS SENT BACK UP TO THE HOPPER TO PICK THE NEXT BLANK TO ERECT.
MACHINE FUNCTION SEQUENCER 1 DATA FILE
INTERNAL RELAY ADVANCE SEQUENCER BIT
0010
EQU
Equal
Source A N7:0 0<
Source B 8 8<
B3:1
0
INTERNAL RELAY 1ST SEQUENCER STEP 8
B3:2
8
INTERNAL RELAY 1ST SEQUENCER STEP 8
B3:2
8
VACUUM GENERATORS SHUT DOWN TIME DELAY
TON
Timer On Delay
Timer T4:6
Time Base 0.01
Preset 20<
Accum 0<
EN
DN
VERTICAL BLANK FEEDER MID POINT PROX SW.
PROX4
I:0
5
1761-Micro
MACHINE FUNCTION SEQUENCER 1 DATA FILE
MOV
Move
Source 9 9<
Dest N7:0 0<
THIS RUNG CONTROLS THE FUNCTION OF THE 9TH STEP OF THE SEQUENCER. THE PUSHING OF THE BOX INTO THE LUG DRIVE OF THE MACHINE AND RESETTING THE BOX ERECTING SEQUENCE.
MACHINE FUNCTION SEQUENCER 1 DATA FILE
DOWN STREAM CASE BACK UP SENSOR
PE1
I:0
9
1761-Micro
CHAIN LUG DETECTOR SIGNAL EXTEND TIMER
T4:14
EN
INTERNAL RELAY 1ST SEQUENCER STEP 9
B3:2
9
0011
EQU
Equal
Source A N7:0 0<
Source B 9 9<
HORIZONTAL BOX PUSHER EXTENDED POSITION
PROX2
I:0
3
1761-Micro
MACHINE FUNCTION SEQUENCER 1 DATA FILE
MOV
Move
Source 1 1<
Dest N7:0 0<
0012
END


MASTER CONTROL RELAY PLC INPUT
K1
I:0
10
1761-Micro
0000
MCR
WHEN THE OUTPUT IS ENERGIZED THE VACUUM CUPS TRAVEL INWARD TOWARDS THE BLANKS. WHEN DE-ENERGIZED THE CUPS TRAVEL OUTWARD TO THEIR RETRACTED POSITION.
INTERNAL RELAY 1ST SEQUENCER STEP 1
B3:2
1
INTERNAL RELAY VACUUM CUPS TRAVEL RESET
B3:0
15
VACUUM CUPS TRAVEL ON VERTICAL MOVER SOLENOID VALVE
SV5
O:0
3
1761-Micro
0001
VACUUM CUPS TRAVEL ON VERTICAL MOVER SOLENOID VALVE
SV5
O:0
3
1761-Micro
THE OUTPUT WHEN ENERGIZED RESETS THE VACUUM CUPS TRAVEL BACK TO THEIR HOME POSITION.
INTERNAL RELAY PROX4 OFF TRANSITION ONE SHOT
PROX4_OFF
B3:0
14
VERTICAL BLANK MOVER SOLENOID VALVE
SV6
O:0
4
1761-Micro
INTERNAL RELAY VACUUM CUPS TRAVEL RESET
B3:0
15
0002
WHEN THEN OUTPUT IS ENERGIZED THE SECOND PUSHER ROD IS EXTEND ACROSS TOWARDS THE OPERATOR SIDE OF THE MACHINE. WHEN THE OUTPUT IS DE-ENERGIZED THE ROD RESET TO ITS RETRACTED POSITION.
INTERNAL RELAY 1ST SEQUENCER STEP 2
B3:2
2
INTERNAL RELAY 1ST SEQUENCER STEP 8
B3:2
8
VACUUM GENERATOR VERT. MOVER SOLENOID VALVE
SV9
O:0
7
1761-Micro
0003
VACUUM GENERATOR VERT. MOVER SOLENOID VALVE
SV9
O:0
7
1761-Micro

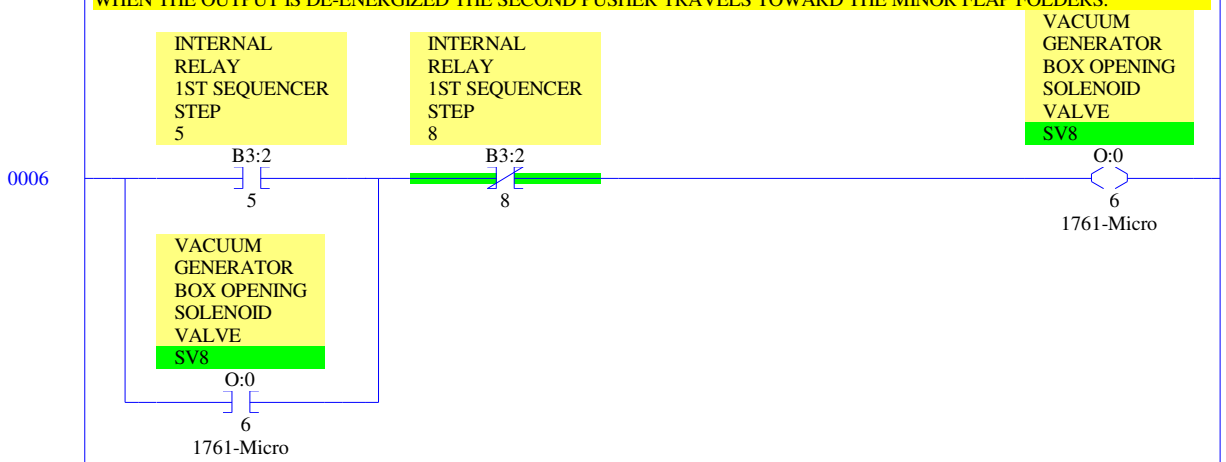
WHEN THE OUTPUT IS ENERGIZED THE VERTICAL BLANK MOVER RETRACTS TOWARDS THE BOX OPENING AREA OF THE MACHINE. WHEN THE OUTPUT IS DE-ENERGIZED THE VERTICAL BLANK MOVER TRAVELS TOWARDS THE BLANK HOPPER.



WHEN THE OUTPUT IS ENERGIZED THE BOX OPENING ARM ROTATES INWARD TOWARDS THE BLANK TO BE OPENED. WHEN THE OUTPUT IS DE-ENERGIZED THE ARM ROTATES TOWARDS ITS OPEN POSITION.



WHEN THE OUTPUT IS ENERGIZED THE SECOND PUSHER TRAVELS TOWARDS THE DISCHARGE END OF THE MACHINE. WHEN THE OUTPUT IS DE-ENERGIZED THE SECOND PUSHER TRAVELS TOWARD THE MINOR FLAP FOLDERS.



WHEN THE OUTPUT IS ENERGIZED THE MINOR FLAP FOLDERS EXTEND TO CLOSE THE MINOR FLAPS. WHEN THE OUTPUT IS DE-ENERGIZED THE FLAP FOLDERS RESET.

0007

INTERNAL RELAY 1ST SEQUENCER STEP 7
B3:2
7

INTERNAL RELAY 1ST SEQUENCER STEP 2
B3:2
2

MINOR FLAP FOLDER SOLENOID VALVE SV4
O:0
2
1761-Micro

MINOR FLAP FOLDER SOLENOID VALVE SV4
O:0
2
1761-Micro

WHEN THE OUTPUT IS ENERGIZED THE FIRST PUSHER TRAVELS TOWARDS THE DISCHARGE END OF THE MACHINE. WHEN THE OUTPUT IS DE-ENERGIZED THE FIRST PUSHER TRAVELS TOWARDS THE VERTICAL BLANK MOVER TROLLEY.

0008

INTERNAL RELAY 1ST SEQUENCER STEP 9
B3:2
9

HORIZONTAL BOX PUSHER EXTENDED POSITION PROX2
I:0
3
1761-Micro

BOX PUSHER SOLENOID VALVE SV7
O:0
5
1761-Micro

BOX PUSHER SOLENOID VALVE SV7
O:0
5
1761-Micro

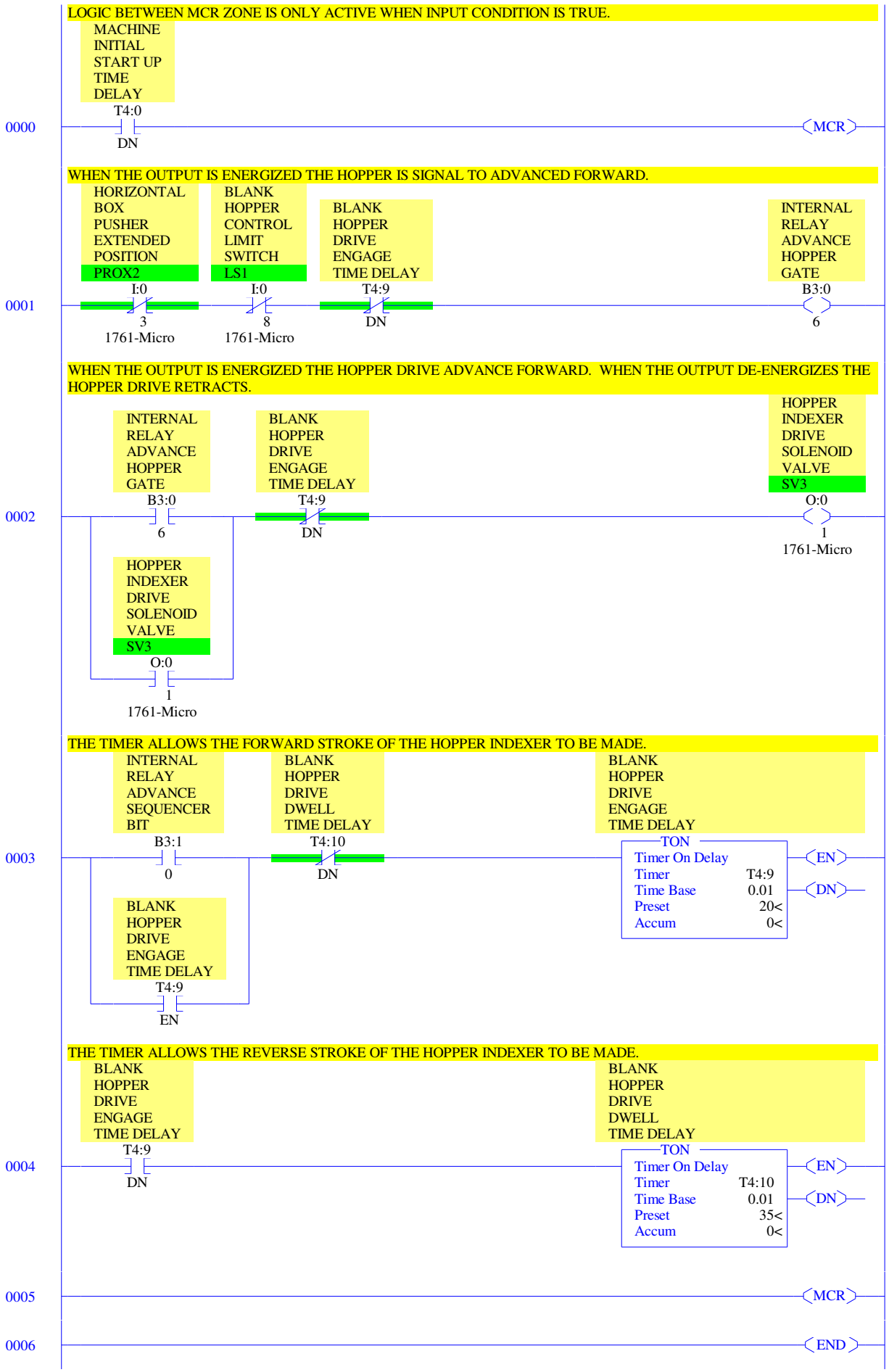
INTERNAL RELAY VERTICAL TROLLEY AND BOX PUSHER COLLISION AVOIDANCE LATCH
B3:5
2

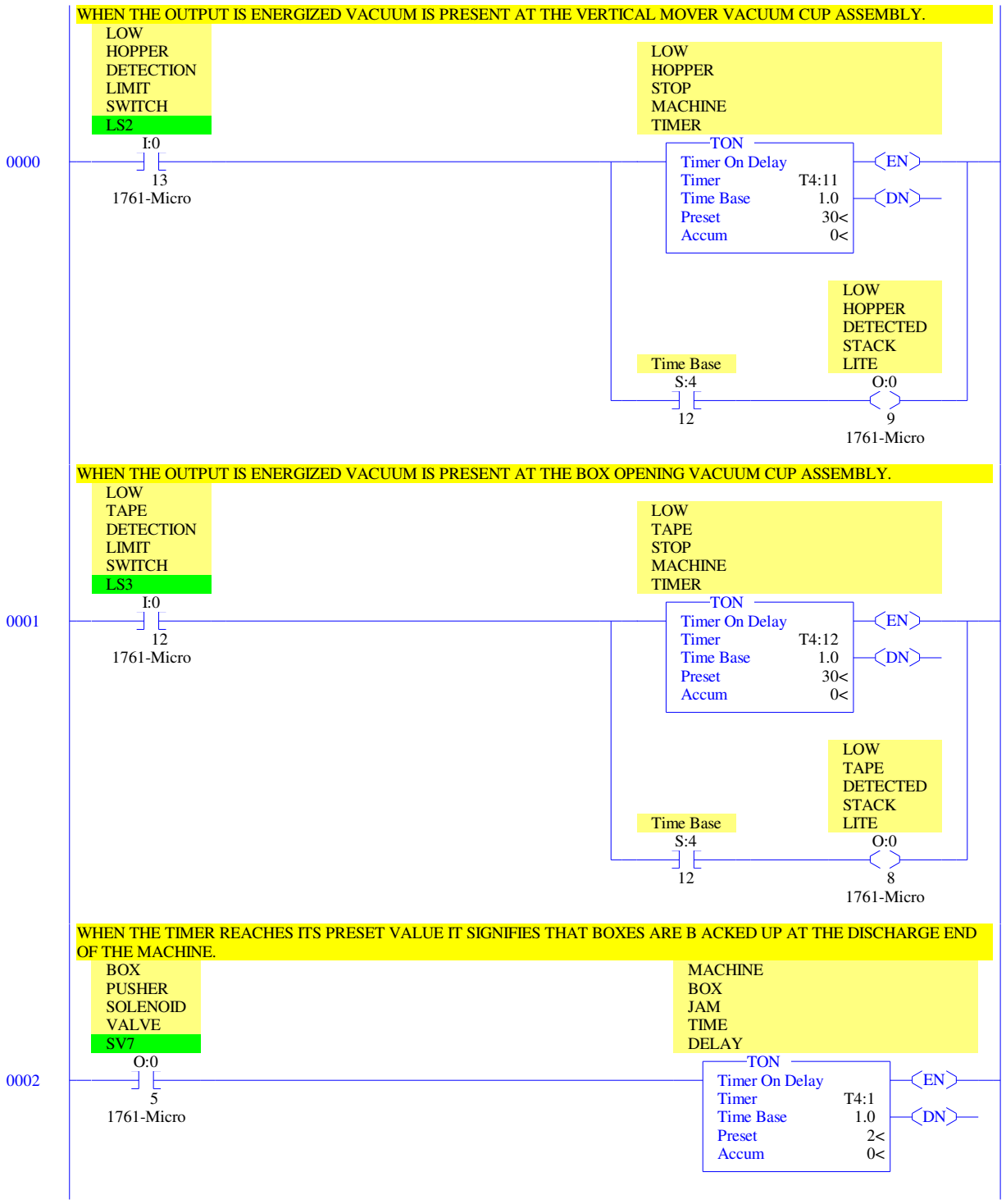
0009

MCR

0010

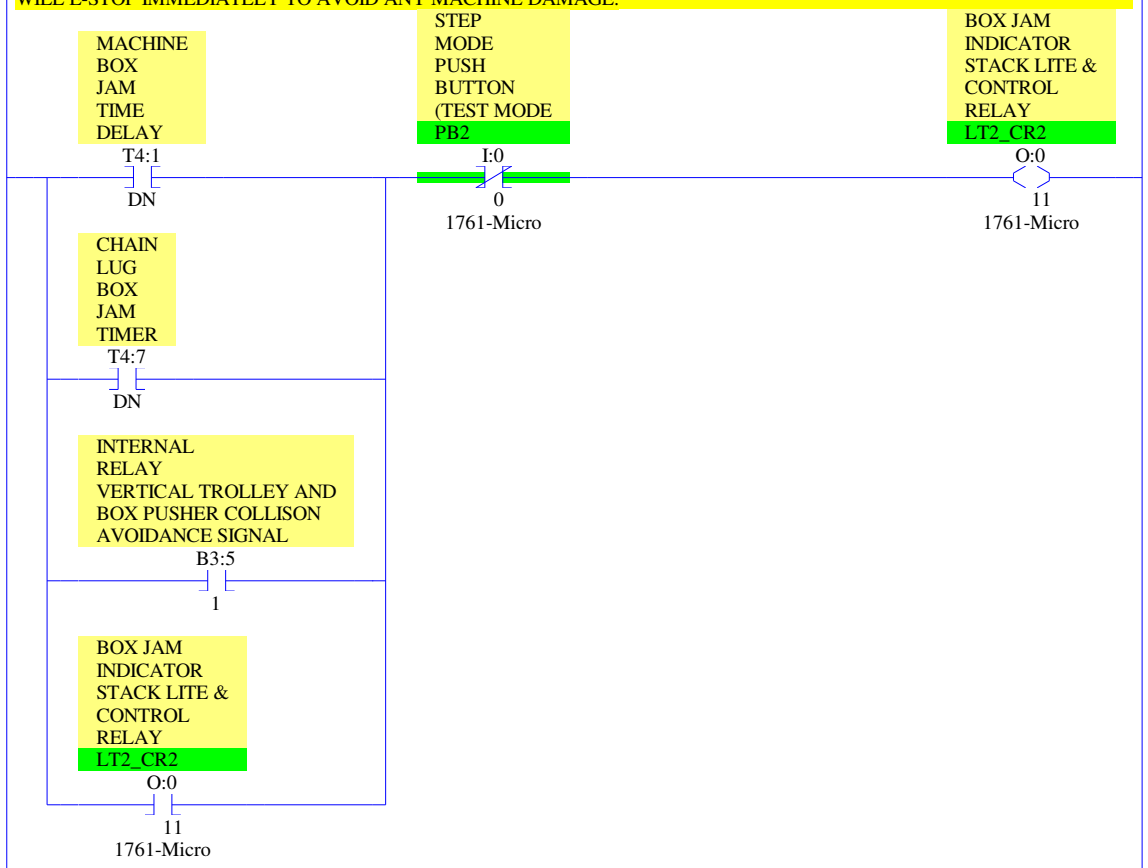
END


LOGIC BETWEEN MCR ZONE IS ONLY ACTIVE WHEN INPUT CONDITION IS TRUE.
MACHINE INITIAL START UP TIME DELAY
T4:0
DN
MCR
0000
WHEN THE OUTPUT IS ENERGIZED THE HOPPER IS SIGNAL TO ADVANCED FORWARD.
HORIZONTAL BOX PUSHER EXTENDED POSITION PROX2
I:0
3
1761-Micro
BLANK HOPPER CONTROL LIMIT SWITCH LS1
I:0
8
1761-Micro
BLANK HOPPER DRIVE ENGAGE TIME DELAY
T4:9
DN
INTERNAL RELAY ADVANCE HOPPER GATE
B3:0
6
0001
WHEN THE OUTPUT IS ENERGIZED THE HOPPER DRIVE ADVANCE FORWARD. WHEN THE OUTPUT DE-ENERGIZES THE HOPPER DRIVE RETRACTS.
INTERNAL RELAY ADVANCE HOPPER GATE
B3:0
6
BLANK HOPPER DRIVE ENGAGE TIME DELAY
T4:9
DN
HOPPER INDEXER DRIVE SOLENOID VALVE SV3
O:0
1
1761-Micro
HOPPER INDEXER DRIVE SOLENOID VALVE SV3
O:0
1
1761-Micro
0002
THE TIMER ALLOWS THE FORWARD STROKE OF THE HOPPER INDEXER TO BE MADE.
INTERNAL RELAY ADVANCE SEQUENCER BIT
B3:1
0
BLANK HOPPER DRIVE DWELL TIME DELAY
T4:10
DN
BLANK HOPPER DRIVE ENGAGE TIME DELAY
T4:9
EN
TON
Timer On Delay
Timer T4:9
Time Base 0.01
Preset 20<
Accum 0<
EN
DN
0003
THE TIMER ALLOWS THE REVERSE STROKE OF THE HOPPER INDEXER TO BE MADE.
BLANK HOPPER DRIVE ENGAGE TIME DELAY
T4:9
DN
BLANK HOPPER DRIVE DWELL TIME DELAY
TON
Timer On Delay
Timer T4:10
Time Base 0.01
Preset 35<
Accum 0<
EN
DN
0004
MCR
0005
END
0006


WHEN THE OUTPUT IS ENERGIZED VACUUM IS PRESENT AT THE VERTICAL MOVER VACUUM CUP ASSEMBLY.
LOW HOPPER DETECTION LIMIT SWITCH LS2
I:0
13
1761-Micro
0000
LOW HOPPER STOP MACHINE TIMER
TON
Timer On Delay
Timer T4:11
Time Base 1.0
Preset 30<
Accum 0<
EN
DN
LOW HOPPER DETECTED STACK LITE
O:0
9
1761-Micro
Time Base
S:4
12
WHEN THE OUTPUT IS ENERGIZED VACUUM IS PRESENT AT THE BOX OPENING VACUUM CUP ASSEMBLY.
LOW TAPE DETECTION LIMIT SWITCH LS3
I:0
12
1761-Micro
0001
LOW TAPE STOP MACHINE TIMER
TON
Timer On Delay
Timer T4:12
Time Base 1.0
Preset 30<
Accum 0<
EN
DN
LOW TAPE DETECTED STACK LITE
O:0
8
1761-Micro
Time Base
S:4
12
WHEN THE TIMER REACHES ITS PRESET VALUE IT SIGNIFIES THAT BOXES ARE B ACKED UP AT THE DISCHARGE END OF THE MACHINE.
BOX PUSHER SOLENOID VALVE SV7
O:0
5
1761-Micro
0002
MACHINE BOX JAM TIME DELAY
TON
Timer On Delay
Timer T4:1
Time Base 1.0
Preset 2<
Accum 0<
EN
DN

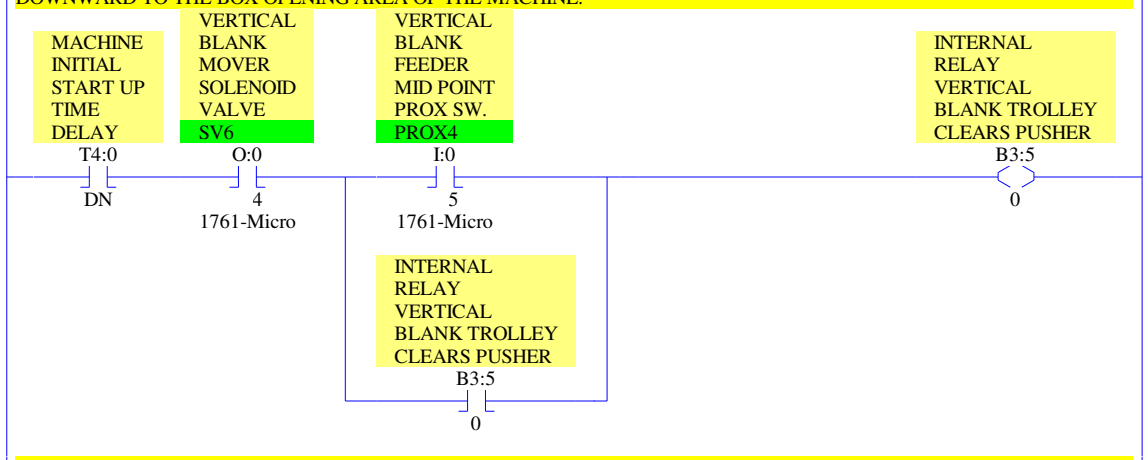
THE OUTPUT IS ENERGIZED WHEN A BOX JAM CONDITON IS DETECTED. THE OUTPUT IS ERGIZED AND THE MACHINE WILL E-STOP IMMEDIATELY TO AVOID ANY MACHINE DAMAGE.

0003



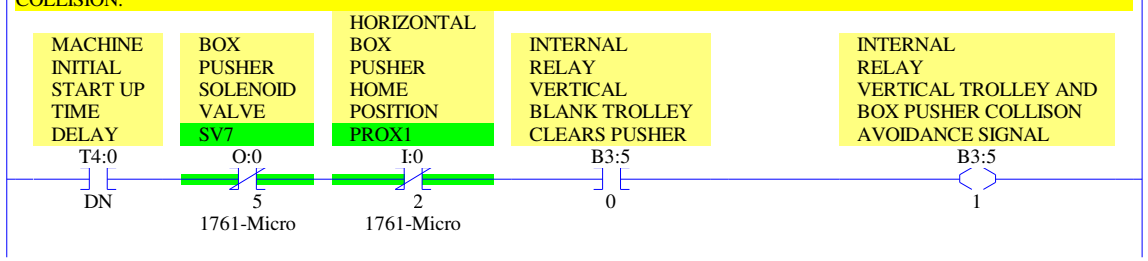
THE OUTPUT IS ENERGIZED WHEN THE VACUUM TROLLEY IS AT THE MID POINT OF ITS TRAVEL AS IT MOVES DOWNWARD TO THE BOX OPENING AREA OF THE MACHINE.

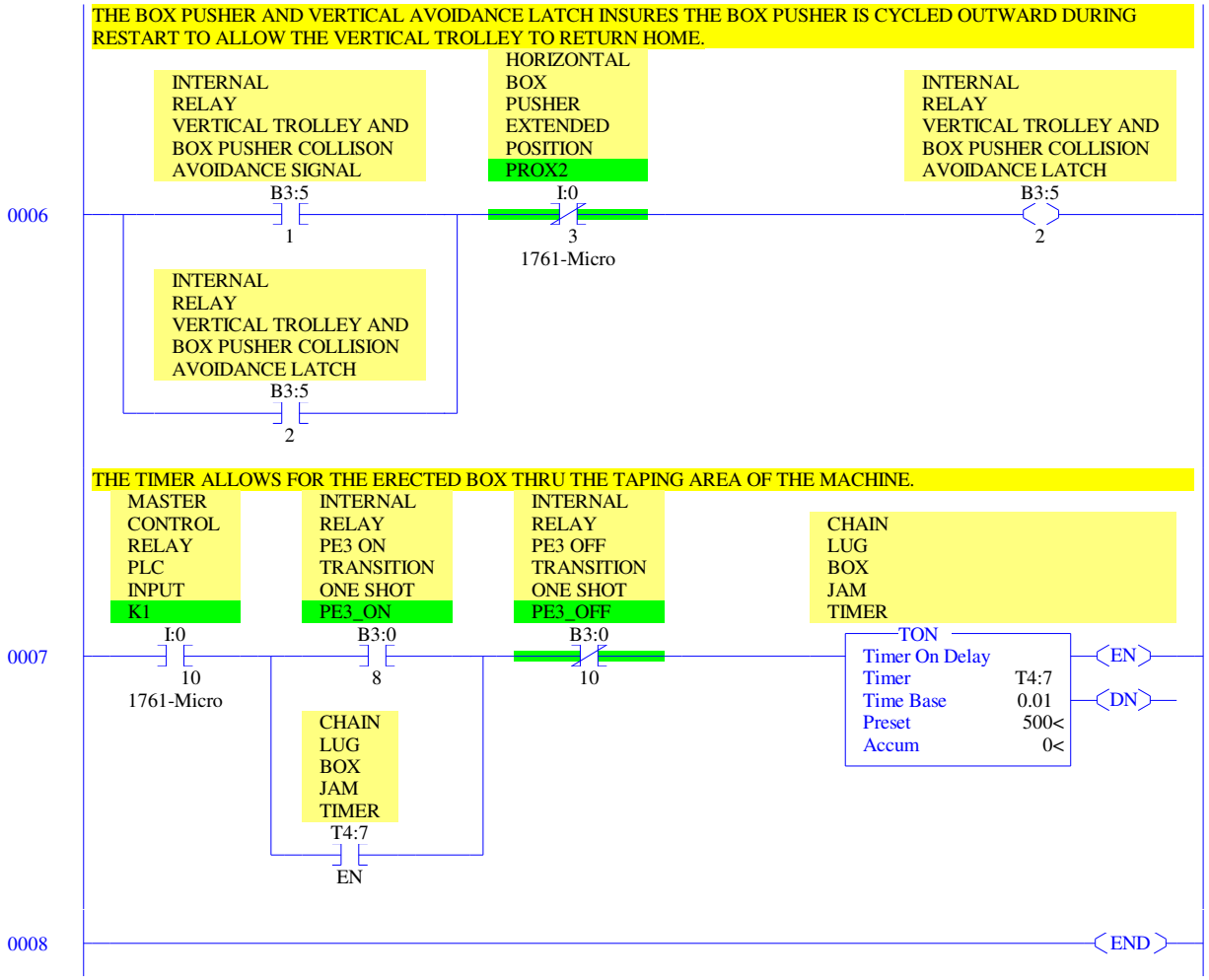
0004



THE OUTPUT IS ENERGIZED WHEN THE BOX PUSHER ASSEMBLY IS NOT HOME PRIOR TO THE VERTICAL TROLLEY IS IN THE BOX OPENING AREA OF THE MACHINE. THE MACHINE WILL IMMEDIATELY SHUT DOWN TO AVOID THE COLLISION.

0005




THE BOX PUSHER AND VERTICAL AVOIDANCE LATCH INSURES THE BOX PUSHER IS CYCLED OUTWARD DURING RESTART TO ALLOW THE VERTICAL TROLLEY TO RETURN HOME.
INTERNAL RELAY VERTICAL TROLLEY AND BOX PUSHER COLLISON AVOIDANCE SIGNAL
B3:5
1
HORIZONTAL BOX PUSHER EXTENDED POSITION
PROX2
I:0
3
1761-Micro
INTERNAL RELAY VERTICAL TROLLEY AND BOX PUSHER COLLISION AVOIDANCE LATCH
B3:5
2
0006
INTERNAL RELAY VERTICAL TROLLEY AND BOX PUSHER COLLISION AVOIDANCE LATCH
B3:5
2
THE TIMER ALLOWS FOR THE ERECTED BOX THRU THE TAPING AREA OF THE MACHINE.
MASTER CONTROL RELAY PLC INPUT
K1
I:0
10
1761-Micro
INTERNAL RELAY PE3 ON TRANSITION ONE SHOT
PE3_ON
B3:0
8
INTERNAL RELAY PE3 OFF TRANSITION ONE SHOT
PE3_OFF
B3:0
10
CHAIN LUG BOX JAM TIMER
T4:7
EN
0007
CHAIN LUG BOX JAM TIMER
TON
Timer On Delay
Timer T4:7
Time Base 0.01
Preset 500
Accum 0
EN
DN
0008
END

```
O:0/0       - {SV2} BOX OPENING ARM SOLENOID VALVE
              OTE - File #6 OUTPUTS - 5
              XIC - File #6 OUTPUTS - 5
O:0/1       - {SV3} HOPPER INDEXER DRIVE SOLENOID VALVE
              OTE - File #7 HOPPER - 2
              XIC - File #7 HOPPER - 2
O:0/2       - {SV4} MINOR FLAP FOLDER SOLENOID VALVE
              OTE - File #6 OUTPUTS - 7
              XIC - File #6 OUTPUTS - 7
O:0/3       - {SV5} VACUUM CUPS TRAVEL ON VERTICAL MOVER SOLENOID VALVE
              OTE - File #6 OUTPUTS - 1
              XIC - File #6 OUTPUTS - 1
O:0/4       - {SV6} VERTICAL BLANK MOVER SOLENOID VALVE
              OTE - File #6 OUTPUTS - 4
              XIC - File #6 OUTPUTS - 4
                    File #8 STATUS - 4
              XIO - File #6 OUTPUTS - 2
O:0/5       - {SV7} BOX PUSHER SOLENOID VALVE
              OTE - File #6 OUTPUTS - 8
              XIC - File #6 OUTPUTS - 8
                    File #8 STATUS - 2
              XIO - File #8 STATUS - 5
O:0/6       - {SV8} VACUUM GENERATOR BOX OPENING SOLENOID VALVE
              OTE - File #6 OUTPUTS - 6
              XIC - File #6 OUTPUTS - 6
O:0/7       - {SV9} VACUUM GENERATOR VERT. MOVER SOLENOID VALVE
              OTE - File #6 OUTPUTS - 3
              XIC - File #6 OUTPUTS - 3
O:0/8       - LOW TAPE DETECTED STACK LITE
              OTE - File #8 STATUS - 1
O:0/9       - LOW HOPPER DETECTED STACK LITE
              OTE - File #8 STATUS - 0
O:0/11      - {LT2_CR2} BOX JAM INDICATOR STACK LITE & CONTROL RELAY
              OTE - File #8 STATUS - 3
              XIC - File #8 STATUS - 3
I:0/0       - {PB2} STEP MODE PUSH BUTTON (TEST MODE
              XIC - File #3 SET UP - 3
              XIO - File #8 STATUS - 3
I:0/1       - {SS1} MACHINE OPERATING MODE SELECTOR SWITCH
              XIC - File #5 1ST SEQ'N - 2
              XIO - File #5 1ST SEQ'N - 2
I:0/2       - {PROX1} HORIZONTAL BOX PUSHER HOME POSITION
              XIC - File #3 SET UP - 2
                    File #5 1ST SEQ'N - 5
              XIO - File #8 STATUS - 5
I:0/3       - {PROX2} HORIZONTAL BOX PUSHER EXTENDED POSITION
              XIC - File #5 1ST SEQ'N - 11
              XIO - File #3 SET UP - 6
                    File #6 OUTPUTS - 8
                    File #7 HOPPER - 1
                    File #8 STATUS - 6
I:0/4       - {PROX3} VERTICAL BLANK FEEDER RETRACTED PROX SW.
              XIC - File #5 1ST SEQ'N - 5
I:0/5       - {PROX4} VERTICAL BLANK FEEDER MID POINT PROX SW.
              XIC - File #5 1ST SEQ'N - 10
                    File #8 STATUS - 4
              XIO - File #3 SET UP - 7
I:0/6       - {PROX5} BOX OPENING ARM RETRACTED PROX SW.
              XIC - File #5 1ST SEQ'N - 8
I:0/7       - {PROX6} BOX OPENING ARM EXTENDED PROX SW.
              XIC - File #5 1ST SEQ'N - 6
I:0/8       - {LS1} BLANK HOPPER CONTROL LIMIT SWITCH
              XIC - File #5 1ST SEQ'N - 3
              XIO - File #7 HOPPER - 1
I:0/9       - {PE1} DOWN STREAM CASE BACK UP SENSOR
              XIC - File #5 1ST SEQ'N - 11
I:0/10      - {K1} MASTER CONTROL RELAY PLC INPUT
              XIC - File #3 SET UP - 8
                    File #4 MACH START - 0
                    File #6 OUTPUTS - 0
                    File #8 STATUS - 7
              XIO - File #5 1ST SEQ'N - 0
I:0/11      - {LS4} VERTICAL BLANK FEEDER HOME LIMIT SW.
              XIC - File #5 1ST SEQ'N - 3
I:0/12      - {LS3} LOW TAPE DETECTION LIMIT SWITCH
              XIC - File #8 STATUS - 1
I:0/13      - {LS2} LOW HOPPER DETECTION LIMIT SWITCH
              XIC - File #8 STATUS - 0
I:0/14      - {PE2} CHAIN LUG DETECTOR PHOTOELECTRIC SENSOR
              XIC - File #3 SET UP - 0
I:0/15      - {PE3} CHAIN LUG BOX JAM DTECTION PHOTOELECTRIC SENSOR
              XIC - File #3 SET UP - 4
              XIO - File #3 SET UP - 5
S:4/12      - XIC - File #8 STATUS - 0, 1
B3:0/0      - INTERNAL RELAY ONE SHOT LOGIC INSTRUCTION
              OSR - File #3 SET UP - 3
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B3:0/1       - INTERNAL RELAY ONE SHOT LOGIC INSTRUCTION
                 OSR - File #3 SET UP - 1
B3:0/2       - INTERNAL RELAY MACHINE STARTED ONE SHOT
                 OTE - File #3 SET UP - 1
                 XIC - File #5 1ST SEQ'N - 1
B3:0/3       - INTERNAL RELAY ONE SHOT LOGIC INSTRUCTION
                 OSR - File #3 SET UP - 2
B3:0/4       - {PROX1_ON} INTERNAL RELAY PROX1 ON TRANSITION ONE SHOT
                 OTE - File #3 SET UP - 2
B3:0/5       - {PB2_ON} INTERNAL RELAY PB2 ON TRANSITION ONE SHOT
                 OTE - File #3 SET UP - 3
                 XIC - File #5 1ST SEQ'N - 2
B3:0/6       - INTERNAL RELAY ADVANCE HOPPER GATE
                 OTE - File #7 HOPPER - 1
                 XIC - File #7 HOPPER - 2
B3:0/7       - INTERNAL RELAY ONE SHOT LOGIC INSTRUCTION
                 OSR - File #3 SET UP - 4
B3:0/8       - {PE3_ON} INTERNAL RELAY PE3 ON TRANSITION ONE SHOT
                 OTE - File #3 SET UP - 4
                 XIC - File #8 STATUS - 7
B3:0/9       - INTERNAL RELAY ONE SHOT LOGIC INSTRUCTION
                 OSR - File #3 SET UP - 5
B3:0/10      - {PE3_OFF} INTERNAL RELAY PE3 OFF TRANSITION ONE SHOT
                 OTE - File #3 SET UP - 5
                 XIO - File #8 STATUS - 7
B3:0/11      - INTERNAL RELAY ONE SHOT LOGIC INSTRUCTION
                 OSR - File #3 SET UP - 6
B3:0/12      - {PROX2_OFF} INTERNAL RELAY PROX2 OFF TRANSITION ONE SHOT
                 OTE - File #3 SET UP - 6
                 XIC - File #3 SET UP - 8
B3:0/13      - INTERNAL RELAY ONE SHOT LOGIC INSTRUCTION
                 OSR - File #3 SET UP - 7
B3:0/14      - {PROX4_OFF} INTERNAL RELAY PROX4 OFF TRANSITION ONE SHOT
                 OTE - File #3 SET UP - 7
                 XIC - File #6 OUTPUTS - 2
B3:0/15      - INTERNAL RELAY VACUUM CUPS TRAVEL RESET
                 OTE - File #6 OUTPUTS - 2
                 XIO - File #6 OUTPUTS - 1
B3:1/0       - INTERNAL RELAY ADVANCE SEQUENCER BIT
                 OTE - File #5 1ST SEQ'N - 2
                 XIC - File #5 1ST SEQ'N - 3, 4, 5, 6, 7, 8, 9, 10
                       File #7 HOPPER - 3
B3:1/1       - INTERNAL RELAY ADVANCE SEQUENCER IN CYCLE
                 OTE - File #3 SET UP - 8
                 XIC - File #3 SET UP - 8
                       File #5 1ST SEQ'N - 5
B3:2/1       - INTERNAL RELAY 1ST SEQUENCER STEP 1
                 OTE - File #5 1ST SEQ'N - 3
                 XIC - File #5 1ST SEQ'N - 3
                       File #6 OUTPUTS - 1
B3:2/2       - INTERNAL RELAY 1ST SEQUENCER STEP 2
                 OTE - File #5 1ST SEQ'N - 4
                 XIC - File #5 1ST SEQ'N - 4
                       File #6 OUTPUTS - 3
                 XIO - File #6 OUTPUTS - 7
B3:2/3       - INTERNAL RELAY 1ST SEQUENCER STEP 3
                 OTE - File #5 1ST SEQ'N - 5
                 XIC - File #5 1ST SEQ'N - 5
                       File #6 OUTPUTS - 4
B3:2/4       - INTERNAL RELAY 1ST SEQUENCER STEP 4
                 OTE - File #5 1ST SEQ'N - 6
                 XIC - File #5 1ST SEQ'N - 6
                       File #6 OUTPUTS - 5
                 XIO - File #3 SET UP - 8
B3:2/5       - INTERNAL RELAY 1ST SEQUENCER STEP 5
                 OTE - File #5 1ST SEQ'N - 7
                 XIC - File #5 1ST SEQ'N - 7
                       File #6 OUTPUTS - 6
B3:2/6       - INTERNAL RELAY 1ST SEQUENCER STEP 6
                 OTE - File #5 1ST SEQ'N - 8
                 XIC - File #5 1ST SEQ'N - 8
                 XIO - File #6 OUTPUTS - 5
B3:2/7       - INTERNAL RELAY 1ST SEQUENCER STEP 7
                 OTE - File #5 1ST SEQ'N - 9
                 XIC - File #5 1ST SEQ'N - 9
                       File #6 OUTPUTS - 7
B3:2/8       - INTERNAL RELAY 1ST SEQUENCER STEP 8
                 OTE - File #5 1ST SEQ'N - 10
                 XIC - File #5 1ST SEQ'N - 10
                 XIO - File #6 OUTPUTS - 3, 6
B3:2/9       - INTERNAL RELAY 1ST SEQUENCER STEP 9
                 OTE - File #5 1ST SEQ'N - 11
                 XIC - File #6 OUTPUTS - 8
B3:5/0       - INTERNAL RELAY VERTICAL BLANK TROLLEY CLEARS PUSHER
                 OTE - File #8 STATUS - 4
                 XIC - File #8 STATUS - 4, 5
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B3:5/1       - INTERNAL RELAY VERTICAL TROLLEY AND BOX PUSHER COLLISON AVOIDANCE SIGNAL
                 OTE - File #8 STATUS - 5
                 XIC - File #8 STATUS - 3, 6
B3:5/2       - INTERNAL RELAY VERTICAL TROLLEY AND BOX PUSHER COLLISION AVOIDANCE LATCH
                 OTE - File #8 STATUS - 6
                 XIC - File #6 OUTPUTS - 8
                       File #8 STATUS - 6
T4:0         - MACHINE INITIAL START UP TIME DELAY
                 TON - File #4 MACH START - 0
T4:0/DN      - XIC - File #3 SET UP - 0, 1
                       File #5 1ST SEQ'N - 2
                       File #7 HOPPER - 0
                       File #8 STATUS - 4, 5
T4:1         - MACHINE BOX JAM TIME DELAY
                 TON - File #8 STATUS - 2
T4:1/DN      - XIC - File #8 STATUS - 3
T4:2         - ESTABLISH VACUUM BOND TO PULL BLANK FROM HOPPER TIME DELAY
                 TON - File #5 1ST SEQ'N - 4
T4:2/DN      - ESTABLISH VACUUM BOND TO PULL BLANK FROM HOPPER TIME DELAY
                 XIC - File #5 1ST SEQ'N - 4
T4:3         - VACUUM CUPS EXTEND INTO HOPPER TO CONTACT BLANK TIME DELAY
                 TON - File #5 1ST SEQ'N - 3
T4:3/DN      - VACUUM CUPS EXTEND INTO HOPPER TO CONTACT BLANK TIME DELAY
                 XIC - File #5 1ST SEQ'N - 3
T4:4         - ESTABLISH VACUUM BOND BEFORE OPENING BOX TIME DELAY
                 TON - File #5 1ST SEQ'N - 7
T4:4/DN      - ESTABLISH VACUUM BOND BEFORE OPENING BOX TIME DELAY
                 XIC - File #5 1ST SEQ'N - 7
T4:5         - MINOR FLAP FOLDERS EXTEND TIME DELAY
                 TON - File #5 1ST SEQ'N - 9
T4:5/DN      - MINOR FLAP FOLDERS EXTEND TIME DELAY
                 XIC - File #5 1ST SEQ'N - 9
T4:6         - VACUUM GENERATORS SHUT DOWN TIME DELAY
                 TON - File #5 1ST SEQ'N - 10
T4:6/DN      - VACUUM GENERATORS SHUT DOWN TIME DELAY
                 XIO - File #6 OUTPUTS - 4
T4:7         - CHAIN LUG BOX JAM TIMER
                 TON - File #8 STATUS - 7
T4:7/DN      - XIC - File #8 STATUS - 3
T4:7/EN      - XIC - File #8 STATUS - 7
T4:9         - BLANK HOPPER DRIVE ENGAGE TIME DELAY
                 TON - File #7 HOPPER - 3
T4:9/DN      - XIC - File #7 HOPPER - 4
                 XIO - File #7 HOPPER - 1, 2
T4:9/EN      - XIC - File #7 HOPPER - 3
T4:10        - BLANK HOPPER DRIVE DWELL TIME DELAY
                 TON - File #7 HOPPER - 4
T4:10/DN     - XIO - File #7 HOPPER - 3
T4:11        - LOW HOPPER STOP MACHINE TIMER
                 TON - File #8 STATUS - 0
T4:11/DN     - XIO - File #5 1ST SEQ'N - 3
T4:12        - LOW TAPE STOP MACHINE TIMER
                 TON - File #8 STATUS - 1
T4:12/DN     - XIO - File #5 1ST SEQ'N - 3
T4:14        - CHAIN LUG DETECTOR SIGNAL EXTEND TIMER
                 TON - File #3 SET UP - 0
T4:14/DN     - XIO - File #3 SET UP - 0
T4:14/EN     - XIC - File #3 SET UP - 0
                       File #5 1ST SEQ'N - 11
N7:0         - MACHINE FUNCTION SEQUENCER 1 DATA FILE
                 MOV - File #5 1ST SEQ'N - 0, 1, 3, 4, 5, 6, 7, 8, 9, 10, 11
                 EQU - File #5 1ST SEQ'N - 3, 4, 5, 6, 7, 8, 9, 10, 11
U:3          - MACHINE SET UP LOGIC SUBROUTINE
                 JSR - File #2 SUBROUTINE - 0
U:4          - MACHINE START LOGIC SUBROUTINE
                 JSR - File #2 SUBROUTINE - 1
U:5          - 1ST CYCLE SEQUENCE LOGIC SUBROUTINE
                 JSR - File #2 SUBROUTINE - 2
U:6          - SEQUENCERS OUTPUTS LOGIC SUBROUTINE
                 JSR - File #2 SUBROUTINE - 3
U:7          - BLANK HOPPER LOGIC SUBROUTINE
                 JSR - File #2 SUBROUTINE - 4
U:8          - MACHINE STATUS INDICATOR LOGIC SUBROUTINE
                 JSR - File #2 SUBROUTINE - 5
```

LITTLE DAVID

TAPE CARTRIDGE MANUAL

.CAC60 /.CAC61

THE LOVESHAW CORPORATION
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SOUTH CANAAN, PA 18459

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LOVESHAW - EUROPE
UNIT 9, BRUNEL GATE
W. PORTWAY INDUSTRIAL ESTATE
ANDOVER, HAMPSHIRE SP103SL
ENGLAND
44-264-3575-11

Part and Instruction Manual

Loveshaw Pressure Sensitive Tape Cartridge

CAC60 – 2” wide tape

CAC61 – 3” wide tape

This is a combined manual for the CAC60 – 2” wide tape and the CAC61 – 3” wide tape. Take care when ordering parts. Make sure it is for the correct width cartridge.

For stainless steel cartridge parts add the suffix “SS” to the part numbers depicted in the assembly drawings.

Theory of Operation:

Pressure sensitive tape is applied to the corrugated box as it passes by the cartridge. The box will contact the front arm roller which has pressure sensitive tape adhesive side facing outward towards the oncoming box. The front leading side of the box will contact the front roller arm and the tape will adhere to the box. As the box continues to move forward the front roller arm and knife arm will be rotated into the frame of the cartridge. The amount of force exerted on the box as tape is being applied is adjustable by changing the position of the main spring. The front arm initial application force can be set to accommodate the strength of the box as well as the sturdiness of the contents in the box.

As the front arm application roller transitions from the leading panel of the box to the top major flaps a separate wipe down spring is engaged. The sole purpose of this spring is to add speed to the rear wipe roller actuation to insure the rear tape tab is completely wiped to the rear trailing panel of the box. At this time the knife arm is retracted into the cartridge and the knife blade guard is fully retracted uncovering the blade. As the knife arm rotated into the cartridge the knife activation spring extends, generating cut force.

As the box proceeds pass the cartridge the front arm roller will no longer contact the major flaps of the box, but the rear wipe roller will still contact the major flaps. Eventually as the box travels the knife arm will completely stop contacting the major flaps of the box. This will allow the knife arm to travel back towards its home position allowing the knife blade to puncture and cut through the tape. As the box continues move the rear wipe arm roller will no longer contact the major flaps of the box. This will allow the wipe arm roller to spring out of the cartridge and contact the rear tab length of tape and press against the trailing panel of the box. The rear wipe arm roller booster spring starts the wipe and the main cartridge spring finishes the wipe sequence.

The box travelling pass the cartridge is the vehicle which pulls the tape through the cartridge. The cartridge is design to run most pressure sensitive tapes with no required adjustments. However in some cases it may be necessary to adjust tape tensions. The cartridge will operate at speeds up to 150 feet/minute.

Important Safety Notices:

Before installing operating or servicing the tape cartridges read carefully and understand the following precautions:

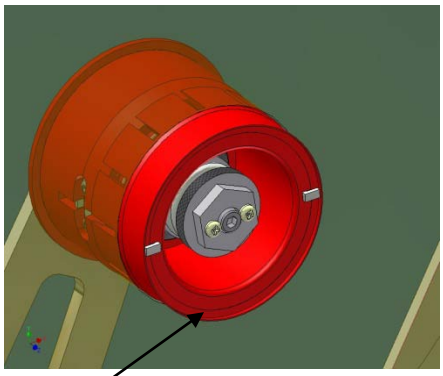
- **Never service the tape cartridges when installed in an operating machine.**
- **Use lock out / tag out protocols before installing or removing cartridges from machinery.**
- **Do not bypass or remove safety guard on knife blade.**
- **Observe caution when near tape cartridge knife. The knife blade is protected by a locking cover which is held closed by the link bar.**
- **Never make any adjustments to the tape cartridges when installed in an operating machine.**

Tape Threading:

The first step is to place the tape roll, on the cartridge exspandable tape core. Rotate the tape tension arm clockwise until it locks in place in its fully open position. (refer to figure 3) The tape core diameter is adjustable by turning the adjustor nut. Turning the adjustor nut c.w. the core diameter increases and turning it c.c.w. the tape core diameter decreases. Decrease the tape core enough in order to place the tape roll on the core. Now turn the adjustor nut clockwise until the tape roll is snuggly held. (refer to figure1)

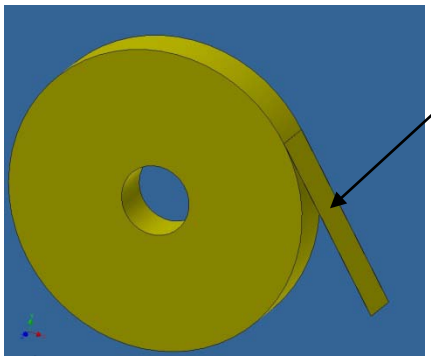
Tape roll must be placed on tape core with adhesive side of tape facing to the right. Refer to figure 2and 3 for proper orientation.

Figure 1



Adjustor nut

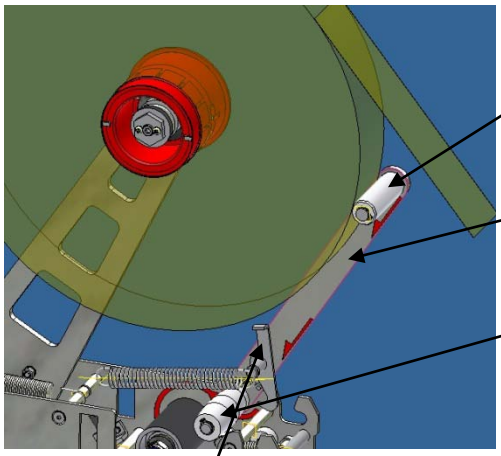
Figure 2



Adhesive side

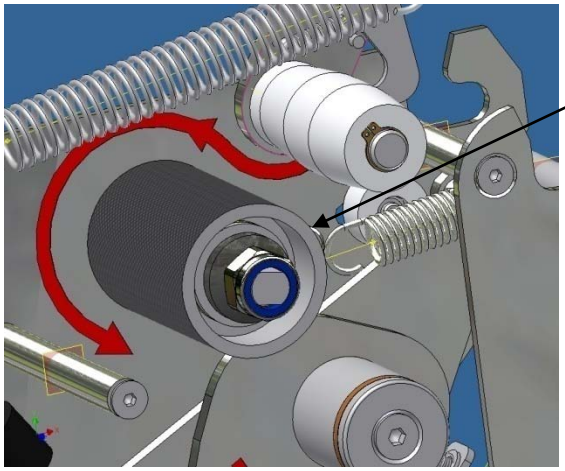
Continue threading the tape over the upper and lower white tension arm rollers. Threading arrows are installed throughout the tape path of the cartridge to aid in threading. The back of the tape, the non adhesive side rides against the front of the rollers. It is important to insure that the tape tension arm is not bent; since this will cause the tape not to track properly through the cartridge. Refer to figure 3.

Figure 3



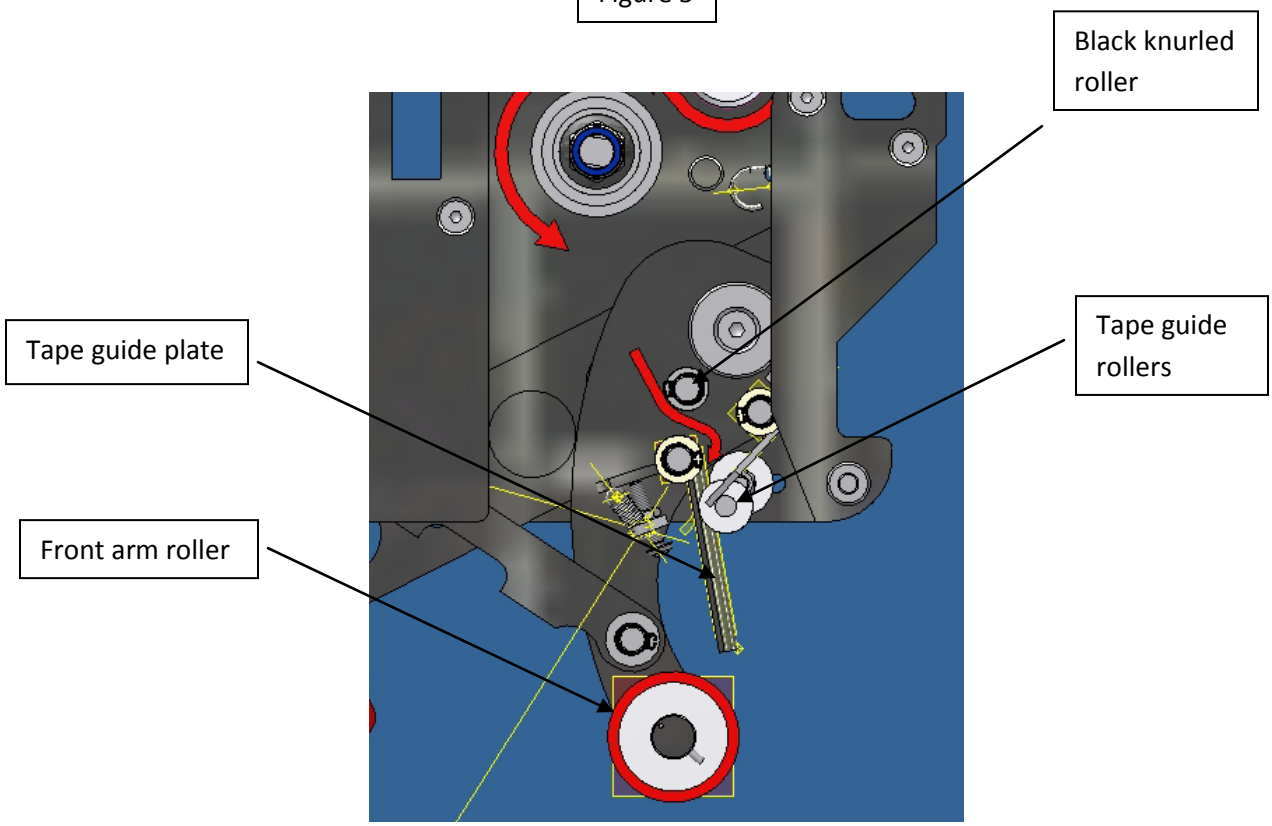
The tape is then threaded around the knurled tape tension roller. The adhesive side of the tape contacts the knurled roller. Refer to figure 4.

Figure 4



The tape is then threaded between black knurled roll and the tape guide plate. The adhesive side of the tape will contact the two tape guide rollers as it is pulled through the guide plate assembly until it is at rest on the front arm roller. The adhesive side of the tape will be facing away from the front arm roller. Refer to figure 5.

Figure 5

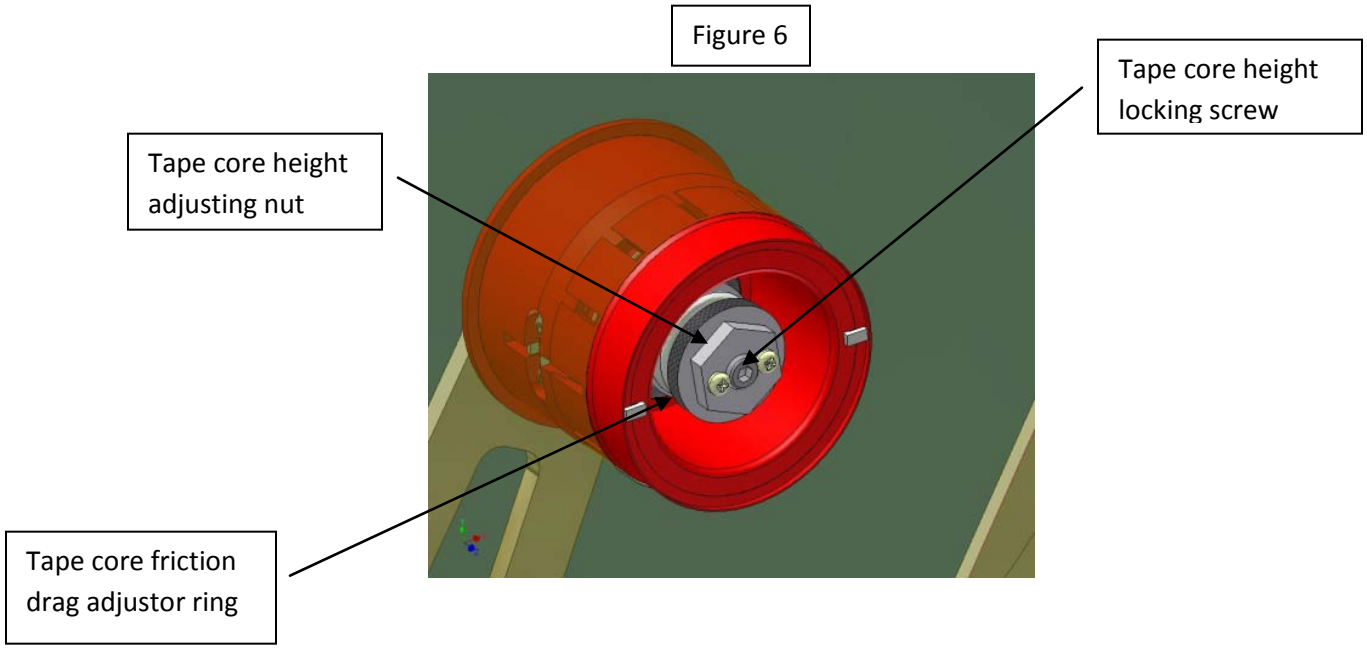


Adjustments:

- **Aligning tape :**

  Aligning tape side to side with in the cartridge frame is done by changing the position of the tape core. This is done by first loosening the tape core locking screw with a 3mm hex key. Turn the tape core locking screw counter clockwise allowing for the desired amount of adjustment to be made. Now turn the tape core height adjusting nut until the desired result is obtained. By turning the tape core height adjusting nut clockwise the tape core height position will decrease moving the tape closer to the mill stand side of the cartridge. By turning the tape core height adjusting nut counter clockwise the tape core height position will increase. This will make the tape track further away from the mill stand. After each adjustment always tighten the tape core locking screw. Failure to do so will allow the tape core position to change as tape is being pulled of f the tape roll. Refer to figure 6

Figure 6



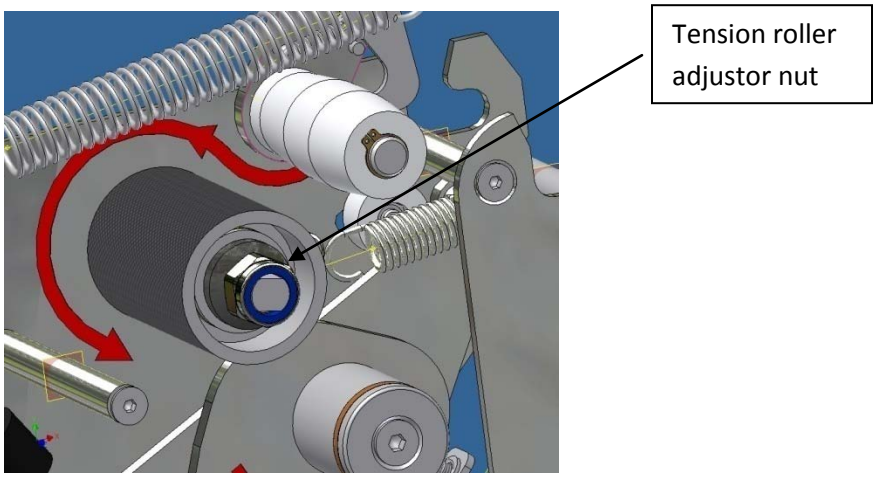
- **Setting tape core drag:**

  The tape core drag setting is factory set to not allow a full roll of tape to free wheel as tape is being pulled off it. The tape tension arm assembly automatically adjusts for the proper amount of tape tension to be applied as the tape roll diminishes in diameter as tape is applied. The drag setting may need to be adjusted if the tape cartridge is being operated at high speed or if the tape adhesive is causing the roll to over rotate as the tape it is being pulled of the roll. Refer to figure 6.

- **Setting the knurled tension roller:**

  The knurled tension roller is factory set to its minimum resistance setting. This setting works for all standard tape applications. The tension roller setting may need to be adjusted if a thick mill tape is being used. By increasing the tension it aids in cutting the tape. Refer to figure7.

Figure 7

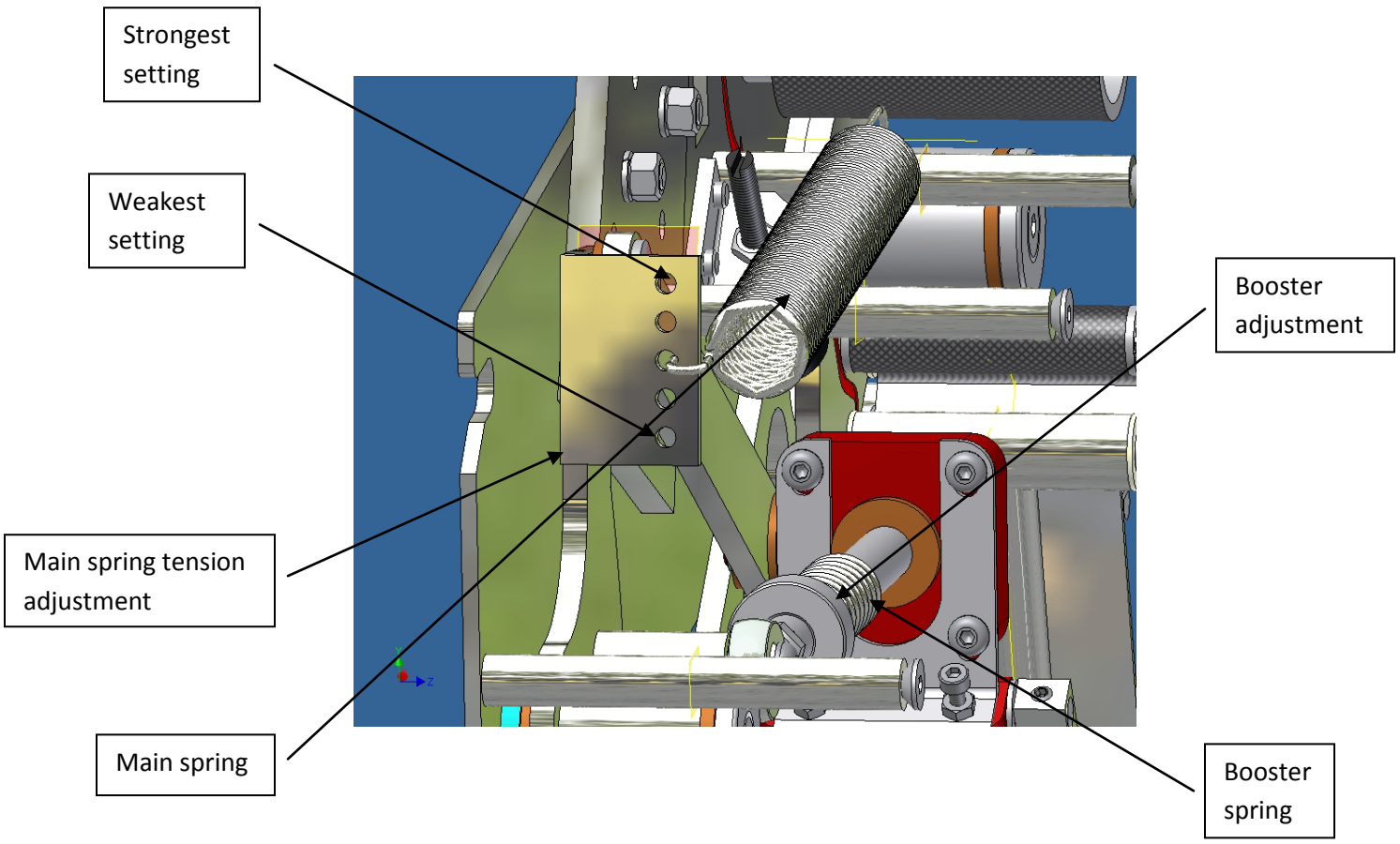


- **Setting main spring tension:**

  Setting the main spring tension is done by moving the end of the spring to a different preset position. The main spring tension is factory set to a mid position. The spring is set from lightest to stoutest dependant on the strength of the corrugated box and the fill of the contents. Void filled,

weak corrugated boxes would be set to the lightest setting while strong corrugated box with overfill would process better with the main spring set stronger. The main spring only effects the application and wipe rollers. Refer to figure 8.

Figure 8



- **Setting booster spring compression**

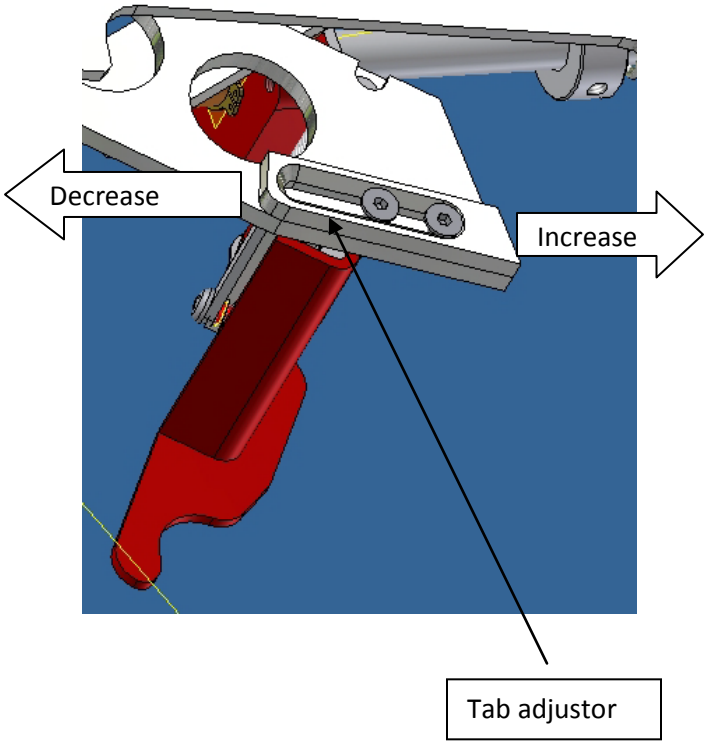
  The booster spring aids in rear tab wipe. The booster spring preloads the wipe roller arm so when the trailing edge of the box releases the wipe roller the arm can travel out a higher rate of speed and contact the rear tab and secure it to the back panel of the box. The booster adjuster is

factory set to lightly engage when the front roller arm is completely retracted. The booster setting is adjusted stronger when the cartridge is operated at higher application speeds. Refer to figure 8.

- **Setting the rear tab cut adjustor:**

  The rear tab cut adjustor is factory set to operate at 60 to 80ft/min belt speed. If the cartridge is operating at higher speeds the adjustor would need to move in order to shorten the rear tab length. The adjustor only alters the rear tab length. The front tab length is fixed and cannot be adjusted. Refer to figure 9.

Figure 9

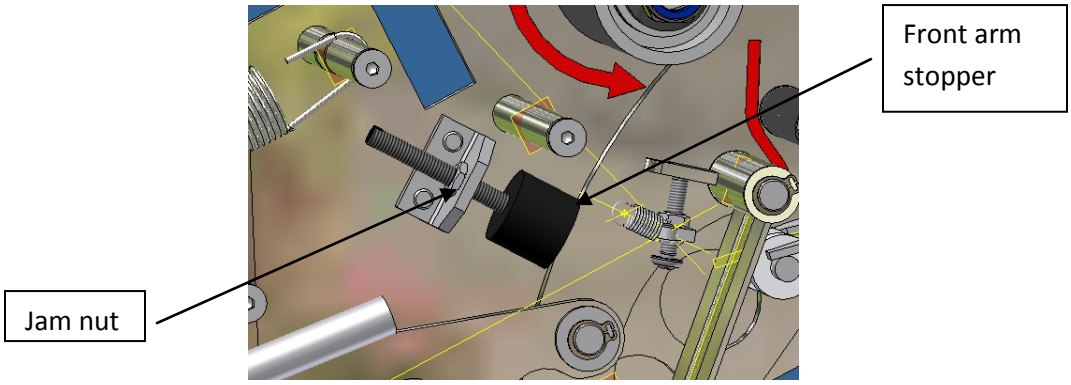


- **Front arm stopper adjustment:**

  The front arm stop adjustment is factory set to insure that the front arm roller stays in contact with major flaps of the box. This allows for a tight tape seal across the horizontal length of the box. The adjustor does not

need to be adjusted for normal applications. In some cases it may be necessary to adjust the stop depending on the type of machine that the cartridge is being used in. If the cartridge is placed in a machine and the tape is not being applied to the major flaps with enough pressure an adjustment will be necessary. This will be evident by inspecting the box as it exits the machine. Normal symptoms include the tape bridging across the major flaps, or the tape bunching up on the major flaps after the tape was cut. Refer to figure 10.

Figure 10

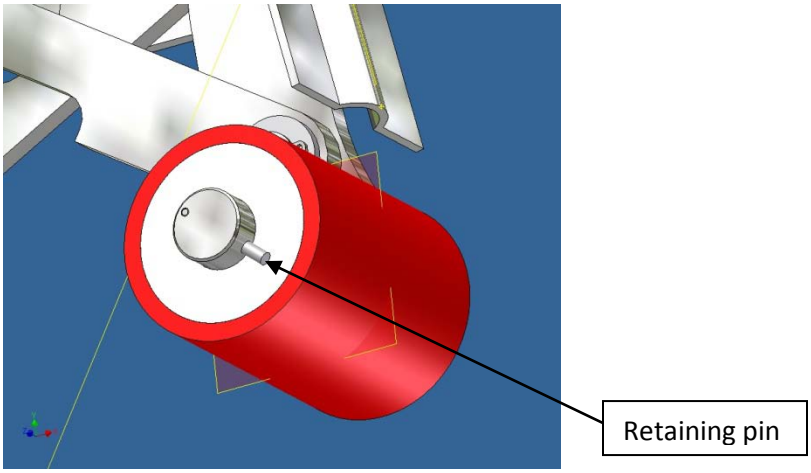


Maintenance:

- **Application / Wipe roller replacement:**

  Roller replacement is a tool less procedure. Simply push down on retaining pin and slide roller off the shaft. Install new roller in opposite fashion. Take caution to install replacement roller with undercut facing toward arm away from retaining pin. Refer to figure 11.

Figure 11



- **Knife blade replacement:**

  Knife blade replacement is a tool less procedure. Simply push down on release bar and pull knife blade out. Fold back the knife guard by first

rotating the front roller arm inward towards the rear wipe arm. Then rotate the knife guard back until the knife blade is fully exposed. While holding the knife guard open slowly release the front roller arm and allow it to extend outward. This will allow the knife guard locking mechanism to hold the knife guard open for easy blade replacement. The knife blades have open slots to allow for easy slide on / off replacements. The knife blade is notch for proper orientation of the blade. Refer to figure 12A and 12B.

- **Oil Pad:**

  Regularly lubricate oil pad with SAE #30 non-detergent oil. Never use penetrating type oil; this will dissolve the adhesive which secures the pad to the knife guard. Refer to figure 12A.

Warning: – Use extreme care when working near the knife blade. The blade is extremely sharp. If care is not taken severe personal injury can occur.

Figure 12A

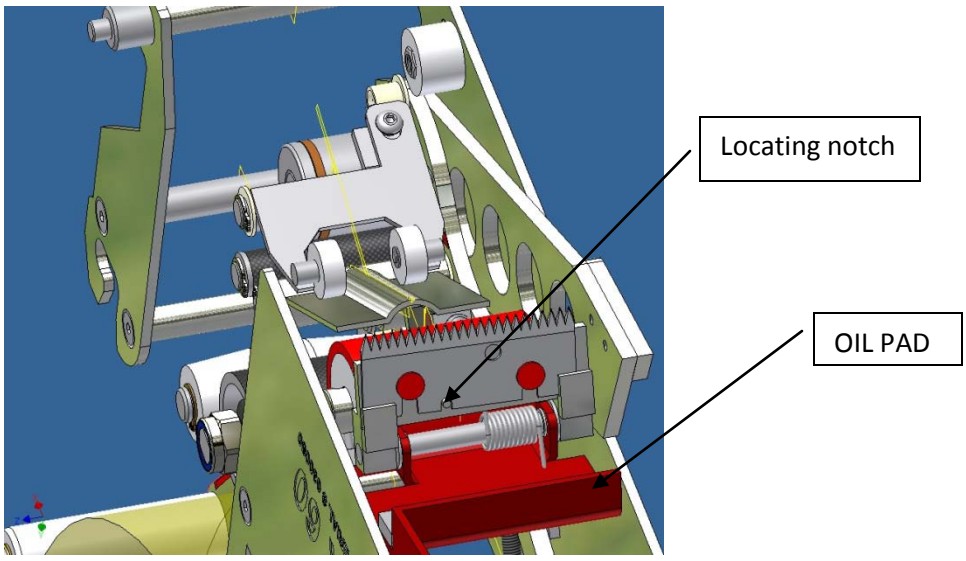
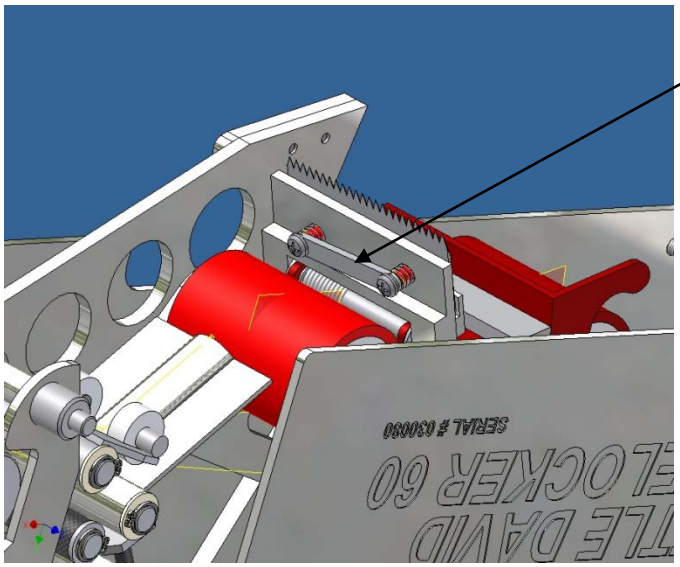


Figure 12B

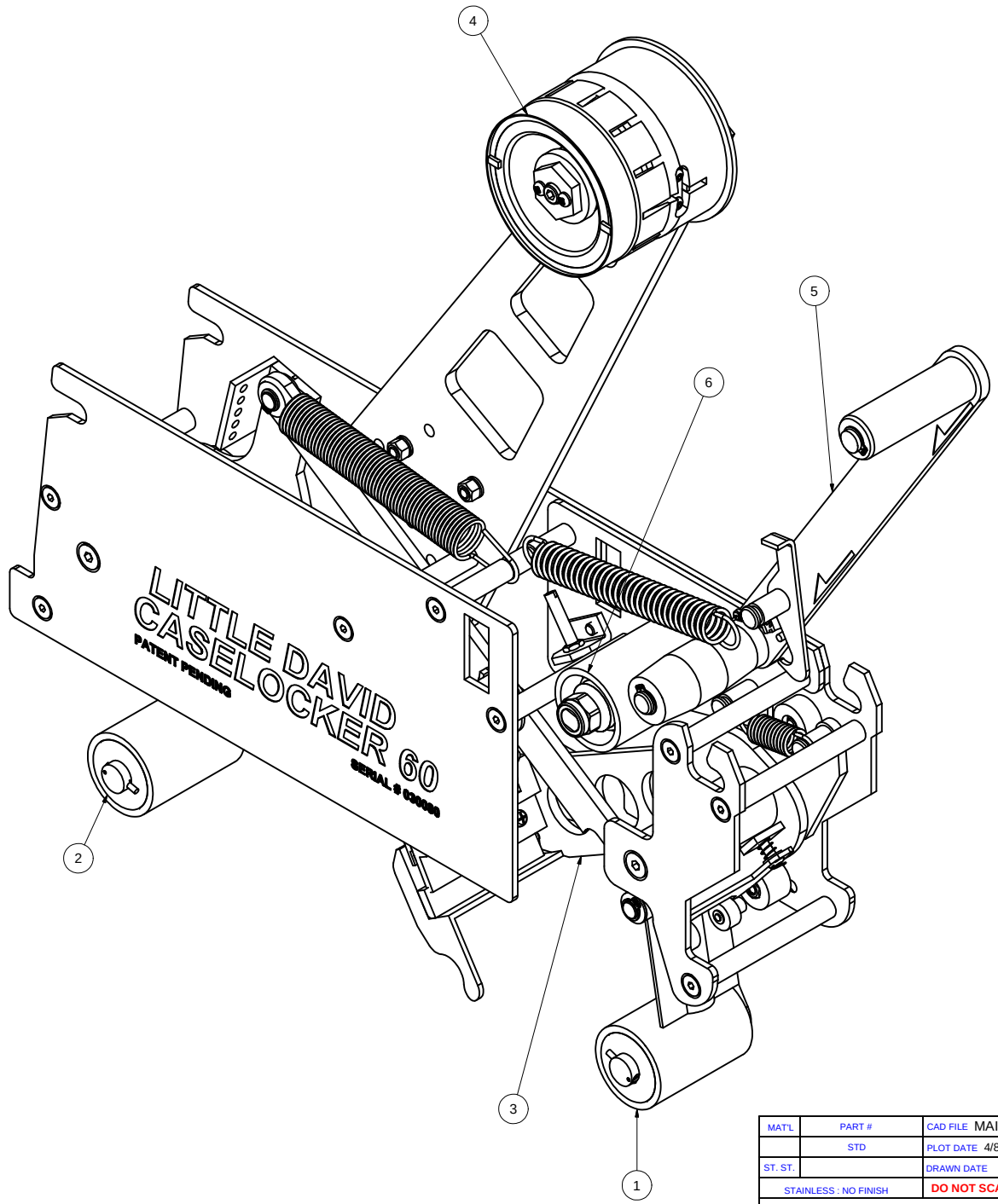


Knife guard is shown open in both figures.

Troubleshooting:

Problem	Cause	Corrective Action
The tape is not cut, or the cut is not clean.	Knife blade is damaged or needs to be cleaned. Tape tension needs to be increased. Tape is not centered on rollers. Knife spring missing or worn. Blade is not lubricated.	Replace knife blade. . Increase drag on knurled tension roller. Adjust tape core height. Replace spring. Oil felt pad on knife guard.
Front tab length too long.	Cartridge threaded incorrectly. Tape tension needs to be increased. Tape is not centered on rollers.	Check threading arrows on cartridge. Increase drag on knurled tension roller. Adjust tape core height.
Rear tab not fully wiped down	Rear tab length too long. Main spring tension to weak. Booster spring not engaged.	Adjust rear tab adjustor. Adjust main spring tension. Adjust booster spring compression.
Rear tab too long.	Tab adjustor not set properly. Knife spring worn. Not enough tape tension	Adjust rear tab adjustor. Replace knife spring. Increase drag on knurled tension roller.
Tape core does not fit into machine cartridge opening. (bottom)	Tape tension arm either misaligned or bent.	Straighten arm so that is parallel with mill stand.

REVISION HISTORY			
REV	DESCRIPTION	DATE	BY
A	RELEASED	11/14/2008	BJF
B	UPDATED	4/19/2010	BJF



PARTS FOR .CAC60 2" CARTRIDGE.

Parts List			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	.FRACAC60	FRONT ROLLER ARM ASSEMBLY
2	1	.RRACAC60	REAR ROLLER ARM ASSEMBLY
3	1	.KAACAC60	KNIFE ARM ASSEMBLY
4	1	.TCA2	TAPE CORE ASSEMBLY 2"
5	1	.TTACAC60	TENSION ARM ASSEMBLY
6	1	.TRA60A	TENSION ROLLER ASSEMBLY

PARTS FOR .CAC61 3" CARTRIDGE.

Parts List			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	.FRACAC61	FRONT ROLLER ARM ASSEMBLY
2	1	.RRACAC61	REAR ROLLER ARM ASSEMBLY
3	1	.KAACAC61	KNIFE ARM ASSEMBLY
4	1	.TCA3	TAPE CORE ASSEMBLY 3"
5	1	.TTACAC61	TENSION ARM ASSEMBLLY
6	1	.TRA61A	TENSION ROLLER ASSEMBLY

MAT'L	PART #	CAD FILE	MAIN ASSY.idw
	STD	PLOT DATE	4/8/2010
ST. ST.		DRAWN DATE	4/7/2010
STAINLESS : NO FINISH		DO NOT SCALE PRINT	

TOLERANCES UNLESS OTHERWISE NOTED:

INCH .X =±.050 .XX =±.015 .XXX =±.005 ANGLES ±1/2°

METRIC .X =±1.0mm .XX =±.3mm .XXX =±.1mm

MACH. FINISH 125

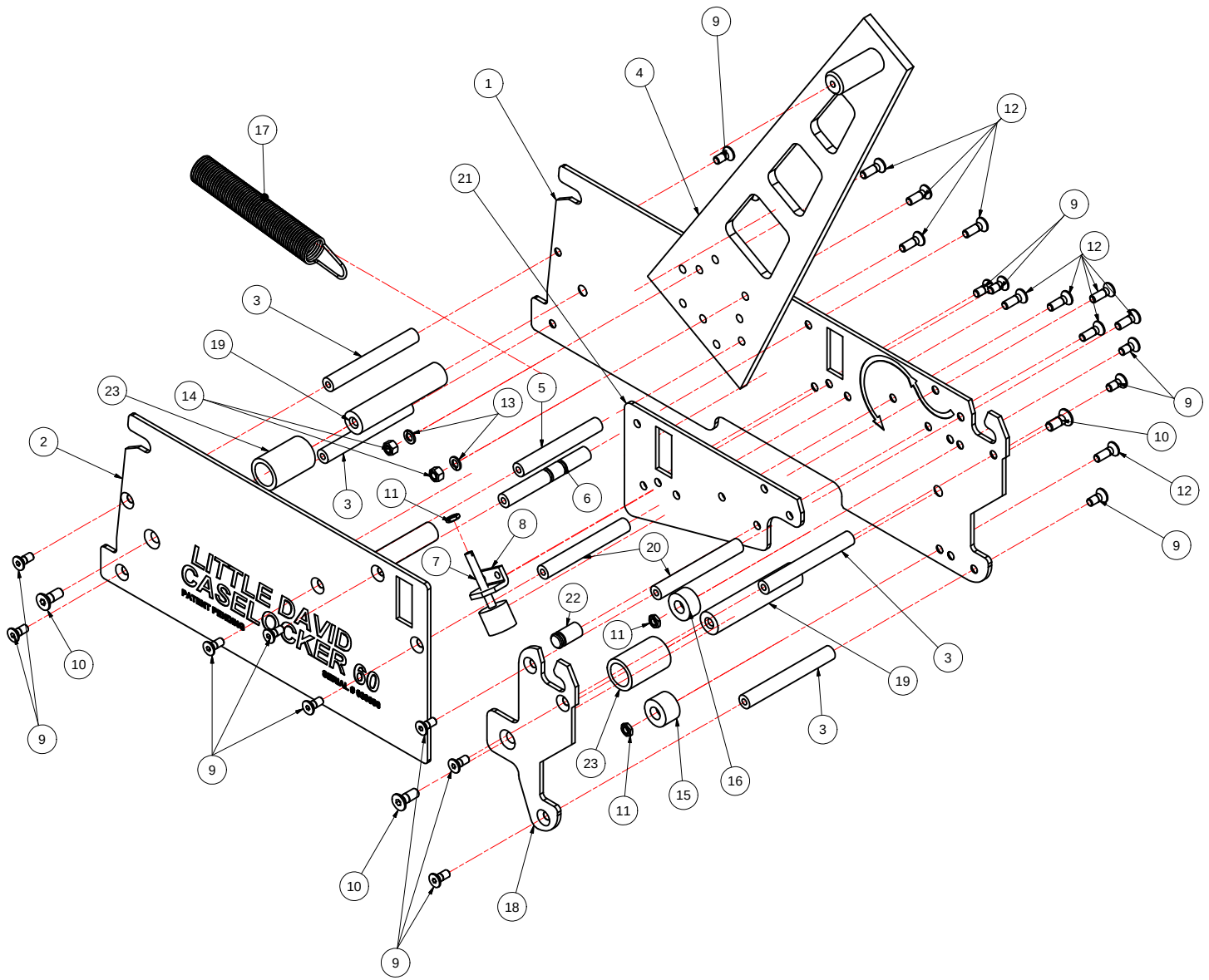
FRACTIONS ± 1/64

LOVESHAW an ITW Company
RT. 296, SOUTH CANAAN, PA.

TITLE .CAC60 / .CAC61 SERIES OVERVIEW

DWG NO	.CAC60 / .CAC61 SERIES	SCALE	3/4:1
MATERIAL		CHECKED	
DRAWN	brycef	APPROVED	

REVISION HISTORY			
REV	DESCRIPTION	DATE	BY
D	UPDATED	4/19/2010	BJF



PARTS FOR .CAC60 2" CARTRIDGE

Parts List			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	CAC60-0000-6	MAIN FRAME
2	1	CAC60-0103-6	SIDE FRAME MEDIUM
3	4	CAC60-0040-3	TIE SHAFT
4	1	CAC60-0031-4	MILLSTAND
5	1	CAC60-0058-3	SHAFT MILLSTAND
6	1	CAC60-0060A-3	SPRING SHAFT
7	1	SPH-1371	RUBBER BUMPER
8	1	CAC60-0071-3	STOP MOUNT
9	15	FFHMF012P10	FHCS M5 X 0.8 X 12 LG.
10	4	FFHMG016P10	FHCS M6 X 1.0 X 16 LG.
11	3	FHJNMFP	M5 HEX JAM NUT
12	10	FFHMF016P10	FHCS M5 X 16 LG.
13	2	FLWMFP	LOCK WASHER M5
14	2	FHFNMFP	HEX NUT M5
15	1	CAC60-0082-3	STOPPER FRONT ARM
16	1	CAC60-0082A-3	STOPPER FRONT ARM
17	1	SPR-1062	MAIN SPRING CARTRIDGE
18	1	CAC60-0097-4	SIDE FRAME, SMALL
19	2	CAC60-0096/2-3	SHAFT
20	2	CAC60-0040A-3	TIE SHAFT
21	1	CAC60-0107-4	SECONDARY FRAME
22	1	CAC60-0108-3	SPRING STUD
23	2	CAC60-0098A-3	NYLON SPACER

PARTS FOR .CAC61 3" CARTRIDGE

Parts List			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	CAC60-0000-6	MAIN FRAME
2	1	CAC60-0103-6	SIDE FRAME MEDIUM
3	4	CAC60-0040/3-3	TIE SHAFT, 3"
4	1	CAC60-0031-4	MILLSTAND
5	1	CAC60-0058/3-3	SHAFT MILLSTAND
6	1	CAC60-0060/3A-4	SPRING SHAFT 3"
7	1	SPH-1371	RUBBER BUMPER
8	1	CAC60-0071-3	STOP MOUNT
9	15	FFHMF012P10	FHCS M5 X 0.8 X 12 LG.
10	4	FFHMG016P10	FHCS M6 X 1.0 X 16 LG.
11	3	FHJNMFP	M5 HEX JAM NUT
12	10	FFHMF016P10	FHCS M5 X 0.8 X 16 LG.
13	2	FLWMFP	LOCK WASHER M5
14	2	FHFNMFP	HEX NUT M5
15	1	CAC60-0082-3	STOPPER FRONT ARM
16	1	CAC60-0082A-3	STOPPER FRONT ARM
17	1	PSC501101-4	MAIN SPRING CARTRIDGE
18	1	CAC60-0097-4	SIDE FRAME, SMALL
19	2	CAC60-0096-3	SHAFT
20	2	CAC60-0040A/3-3	TIE SHAFT, 3"
21	1	CAC60-0107-4	SECONDARY FRAME
22	1	CAC60-0108-3	SPRING STUD
23	2	CAC60-0098/2A-3	NYLON SPACER

MAT'L	PART #	CAD FILE	MAIN ASSY EXP.idw
	STD	PLOT DATE	4/19/2010
ST. ST.		DRAWN DATE	4/8/2010
STAINLESS : NO FINISH		DO NOT SCALE PRINT	

TOLERANCES UNLESS OTHERWISE NOTED:
INCH .X =±.050 .XX =±.015 .XXX =±.005 ANGLES ±1/2°
METRIC .X =±1.0mm .XX =±.3mm .XXX =±.1mm MACH. FINISH 125
FRACTIONS ± 1/64

LOVESHAW an *ITW* Company
RT. 296, SOUTH CANAAN, PA.

TITLE
BASE ASSEMBLY 2" / 3"

DWG NO	.CAC60 / .CAC61 SERIES	SCALE	1/2:1
MATERIAL		CHECKED	
DRAWN	brycef	APPROVED	

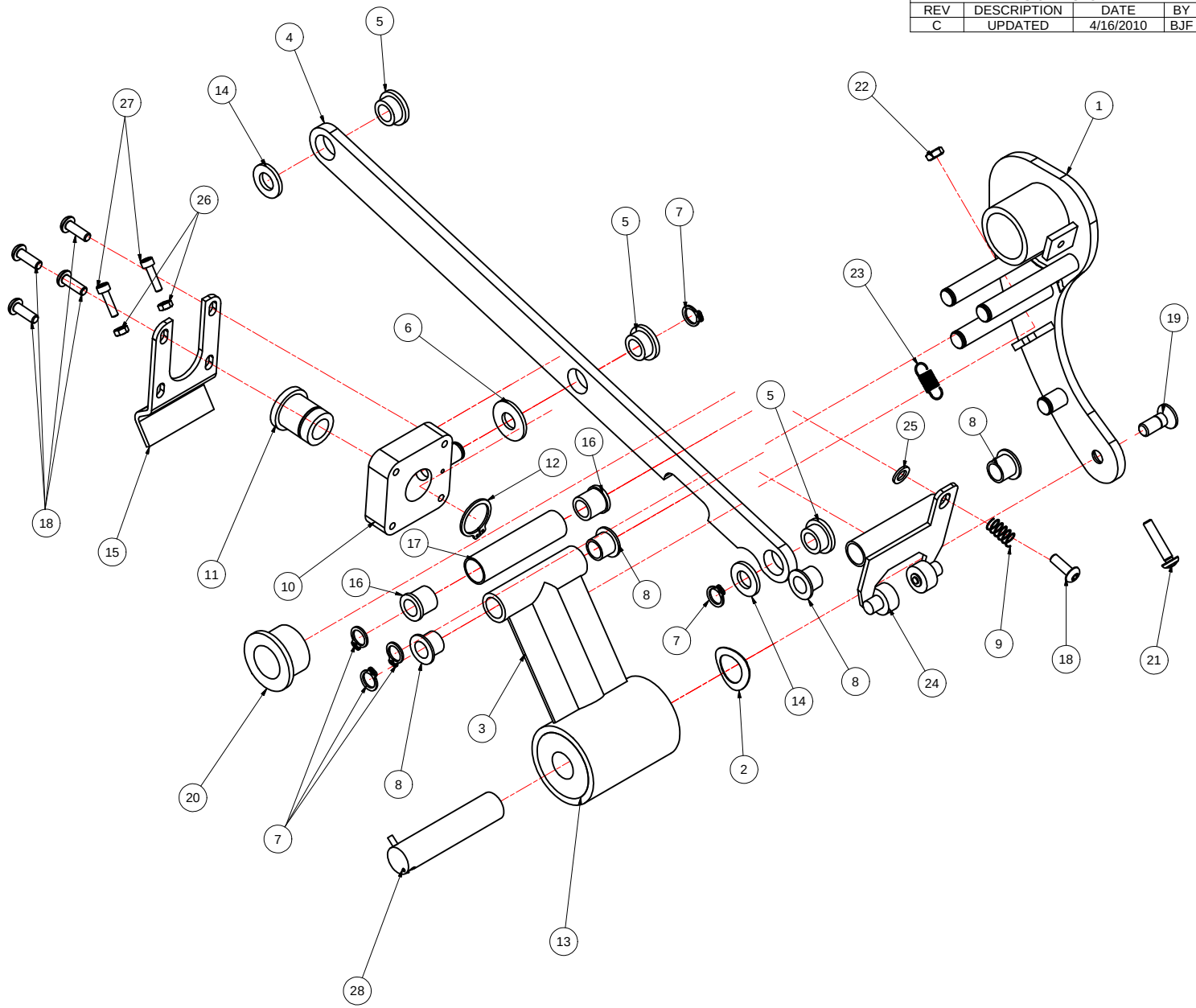
REVISION HISTORY			
REV	DESCRIPTION	DATE	BY
C	UPDATED	4/16/2010	BJF

PARTS FOR .CAC60 2" CARTRIDGE

Parts List			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	CAC60-0001-6	FRONT ROLLER ARM
2	1	SPH-1252	WAVE WASHER
3	1	CAC60-0004-4	TAPE GUIDE PLATE
4	1	CAC60-0007-5	LINK BAR
5	3	CAC60-0047-3	BUSHING, OILITE
6	1	SPH-1277	5/16 BRONZE WASHER
7	5	SPH-1276	SNAP RING, 8mm
8	4	BSG-1090	8mm FLANGE BUSHING
9	1	SPR-1044	SPRING, COMPRESSION
10	1	CAC60-0008-4	SLIDING BLOCK
11	1	CAC60-0009-3	BUSHING
12	1	SPH-1334	EXT. SNAP RING, 16mm
13	1	CAC60-0002-4	ROLLER
14	2	SPH-1339	M8 WASHER
15	1	CAC60-0068-4	KNIFE GUARD LOCK
16	2	BSG-1098	BUSHING
17	1	CAC60-0073-3	SMALL ROLLER
18	5	FBHME012P10	M4 x 12 BUTTON HEAD
19	1	FFHMG016P10	FHCS M6 X 1.0 X 16 LG.
20	1	BSG-1085	BUSHING 16mm
21	1	FBHME020P10	M4 x 20 PAN HEAD SCREW
22	1	FHFNMEP	M4 HEX NUT
23	1	SPR-1055	EXTENSION SPRING
24	1	.FPACAC60	FINGER PLATE ASSEMBLY
25	1	FFWMFP	FLAT WASHER M5
26	2	FHJNMDP	M3 x 0.5 Hex Nut
27	2	FSHMD012P10	CAP SCREW M3 x 12 LG.
28	1	.SA60	SHAFT ASSEMBLY

PARTS FOR .CAC61 3" CARTRIDGE

Parts List			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	CAC60-0001/3-6	FRONT ROLLER ARM
2	1	SPH-1252	WAVE WASHER
3	1	CAC60-0004/3-4	TAPE GUIDE PLATE 3"
4	1	CAC60-0007-5	LINK BAR
5	3	CAC60-0047-3	BUSHING, OILITE
6	1	SPH-1277	5/16 BRONZE WASHER
7	5	SPH-1276	SNAP RING, 8mm
8	4	BSG-1090	8mm FLANGE BUSHING
9	1	SPR-1044	SPRING, COMPRESSION
10	1	CAC60-0008-4	SLIDING BLOCK
11	1	CAC60-0009-3	BUSHING
12	1	SPH-1334	EXT. SNAP RING, 16mm
13	1	CAC60-0002/3-4	ROLLER
14	2	SPH-1339	M8 WASHER
15	1	CAC60-0068-4	KNIFE GUARD LOCK
16	2	BSG-1098	BUSHING
17	1	CAC60-0073/3-3	SMALL ROLLER
18	5	FBHME012P10	M4 x 12 BUTTON HEAD
19	1	FFHMG016P10	FHCS M6 X 1.0 X 16 LG.
20	1	BSG-1085	BUSHING 16mm
21	1	FBHME020P10	M4 x 20 PAN HEAD SCREW
22	1	FHFNMEP	M4 HEX NUT
23	1	SPR-1055	EXTENSION SPRING
24	1	.FPACAC61	FINGER PLATE ASSEMBLY
25	1	FFWMFP	FLAT WASHER M5
26	2	FHJNMDP	M3 x 0.5 Hex Nut
27	2	FSHMD012P10	CAP SCREW M3 x 12 LG.
28	1	.SA61	SHAFT ASSEMBLY



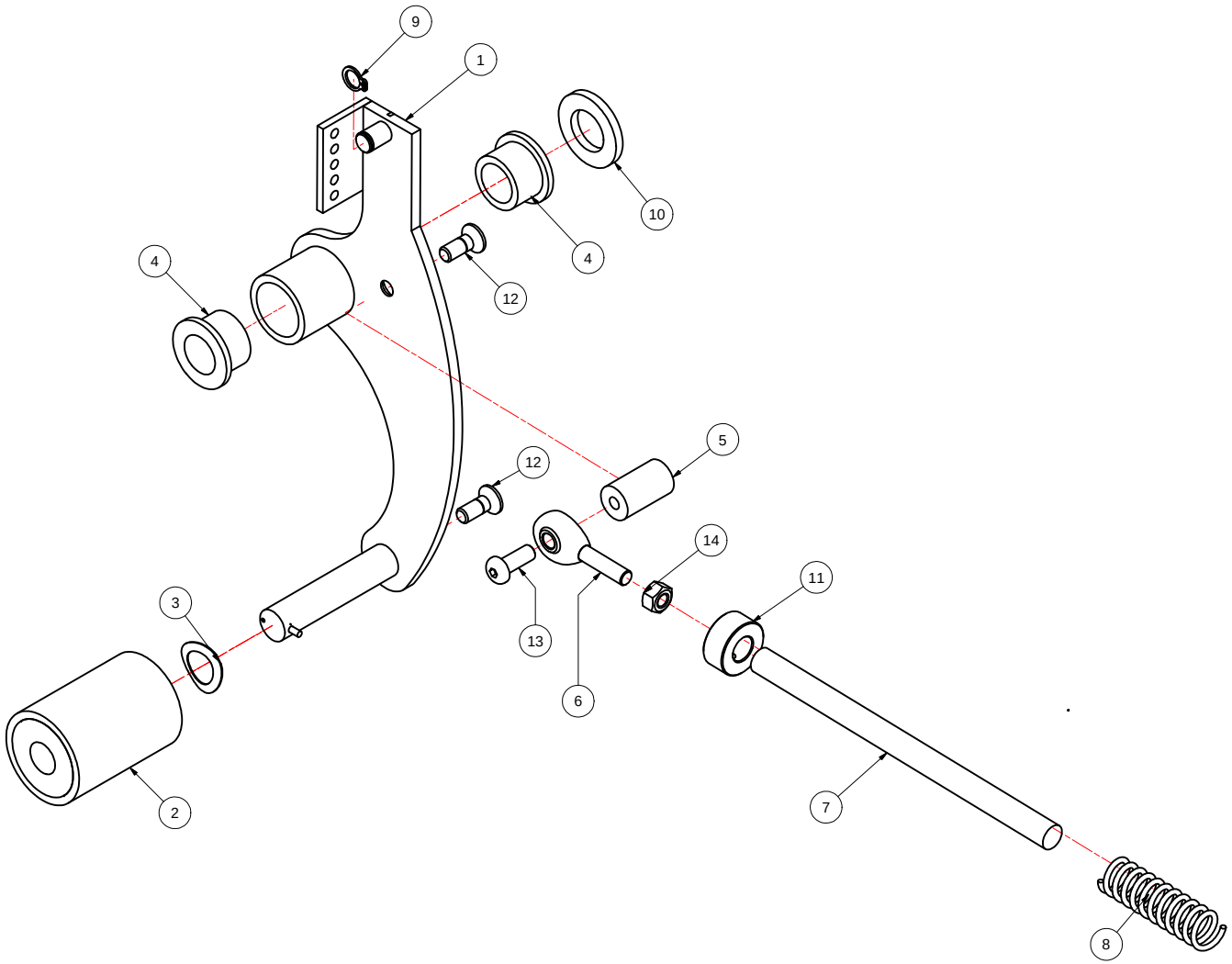
MAT'L	PART #	CAD FILE FRACAC60/61	TOLERANCES UNLESS OTHERWISE NOTED:
	STD	PLOT DATE 4/19/2010	
ST. ST.		DRAWN DATE 4/16/2010	INCH .X = ±.050, .XX = ±.015, .XXX = ±.005, ANGLES ± 1/2°
STAINLESS : NO FINISH		DO NOT SCALE PRINT	METRIC .X = ±1.0mm, .XX = ±.3mm, .XXX = ±.1mm, MACH. FINISH 125
			FRACTIONS ± 1/64

LOVESHAW an ITW Company
RT. 296, SOUTH CANAAN, PA.

TITLE: FRONT ROLLER ARM

DWG NO .FRACAC60/61	SCALE 3/4:1
MATERIAL	CHECKED
DRAWN brycef	APPROVED

REVISION HISTORY			
REV	DESCRIPTION	DATE	BY
D	UPDATED	4/19/2010	BJF



PARTS FOR .CAC60 2" CARTRIDGE

Parts List			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	CAC60-0006-5	REAR ROLLER ARM
2	1	CAC60-0002-4	ROLLER
3	1	SPH-1252	WAVE WASHER
4	2	BSG-1085	BUSHING 16mm
5	1	CAC60-0018-3	STANDOFF
6	1	SPH-1267	ROD END, M6
7	1	CAC60-0010-4	SLIDING ROD
8	1	SPR-1036	COMPRESSION SPRING
9	1	SPH-1276	RETAINING RING 8mm
10	1	CAC60-0034-3	SPACER
11	1	SPH-1338	SHAFT COLLAR
12	2	FFHMG016P10	FL. HD. CAP SCREW M6 X 1.0 X 16 LG.
13	1	FBHMF016P10	BUTT. HD. CAP SCREW M6 X 16 LG.
14	1	FHFNMGP	HEX NUT M6
15	1	.SA60	SHAFT ASSEMBLY

PARTS FOR .CAC61 3" CARTRIDGE

Parts List			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	CAC60-0006-5	REAR ROLLER ARM
2	1	CAC60-0002/3-4	ROLLER
3	1	SPH-1252	WAVE WASHER
4	2	BSG-1085	BUSHING 16mm
5	1	CAC60-0018-3	STANDOFF
6	1	SPH-1267	ROD END , M6
7	1	CAC60-0010-4	SLIDING ROD
8	1	SPR-1036	COMPRRESSION SPRING
9	1	SPH-1276	RETAINING RING 8mm
10	1	CAC60-0034-3	SPACER
11	1	SPH-1338	SHAFT COLLAR
12	2	FFHMG016P10	FL. HD. CAP SCREW M6 X 1.0 X 16 LG.
13	1	FBHMF016P10	BUTT. HD. CAP SCREW M6 X 16 LG.
14	1	FHFNMGP	HEX NUT M6
15	1	.SA61	SHAFT ASSEMBLY

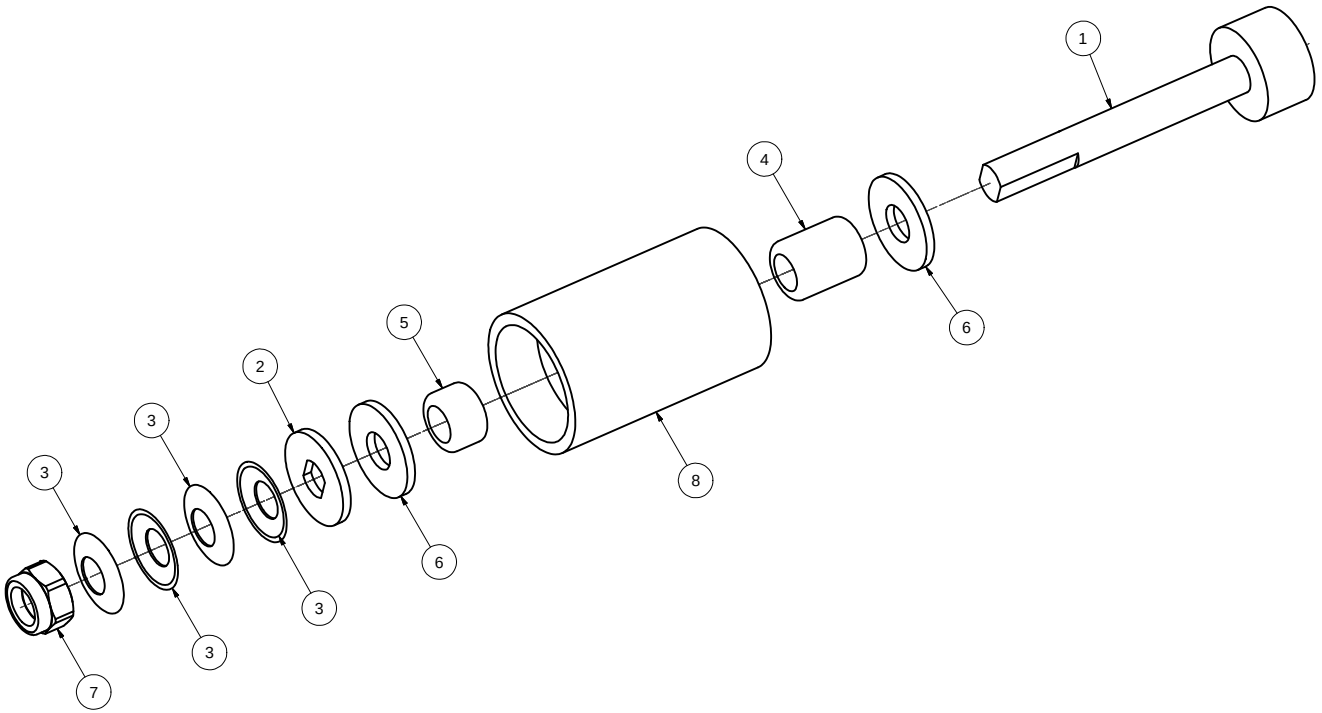
MAT'L	PART #	CAD FILE RRACAC60.idw	TOLERANCES UNLESS OTHERWISE NOTED:
	STD	PLOT DATE 4/20/2010	
ST. ST.		DRAWN DATE 6/25/2008	INCH .X =±.050 .XX =±.015 .XXX =±.005 ANGLES ±1/2°
STAINLESS : NO FINISH		DO NOT SCALE PRINT	METRIC .X =±1.0mm .XX =±.3mm .XXX =±.1mm MACH. FINISH 125
			FRACTIONS ± 1/64

LOVESHAW an ITW Company
RT. 296, SOUTH CANAAN, PA.

TITLE
REAR ROLLER ARM ASSEMBLY

DWG NO .RRACAC60/61	SCALE
MATERIAL	CHECKED
DRAWN AMYR	APPROVED

REVISION HISTORY			
REV	DESCRIPTION	DATE	BY
A	RELEASED	4/19/2010	BJF



PARTS FOR .CAC60 2" CARTRIDGE

Parts List			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	CAC60-0074/A-4	SHAFT, KNURLED ROLLER
2	1	CAC60-0077-3	LOCKING WASHER
3	4	PSC321039A	WASHER, SPRING
4	1	BRG-1098	BEARING
5	1	BRG-1099	BEARING
6	2	CAC60-0076-3	BRAKE WASHER
7	1	FNLNMIP	NYLOCK NUT M10
8	1	CAC60-0075-4	KNURLED ROLLER

PARTS FOR .CAC61 3" CARTRIDGE

Parts List			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	CAC60-0074/3A-4	SHAFT, KNURLED ROLLER
2	1	CAC60-0077-3	LOCKING WASHER
3	4	PSC321039A	WASHER, SPRING
4	1	BRG-1098	BEARING
5	1	BRG-1099	BEARING
6	2	CAC60-0076-3	BRAKE WASHER
7	1	FNLNMIP	NYLOCK NUT M10
8	1	CAC60-0075/3-4	KNURLED ROLLER

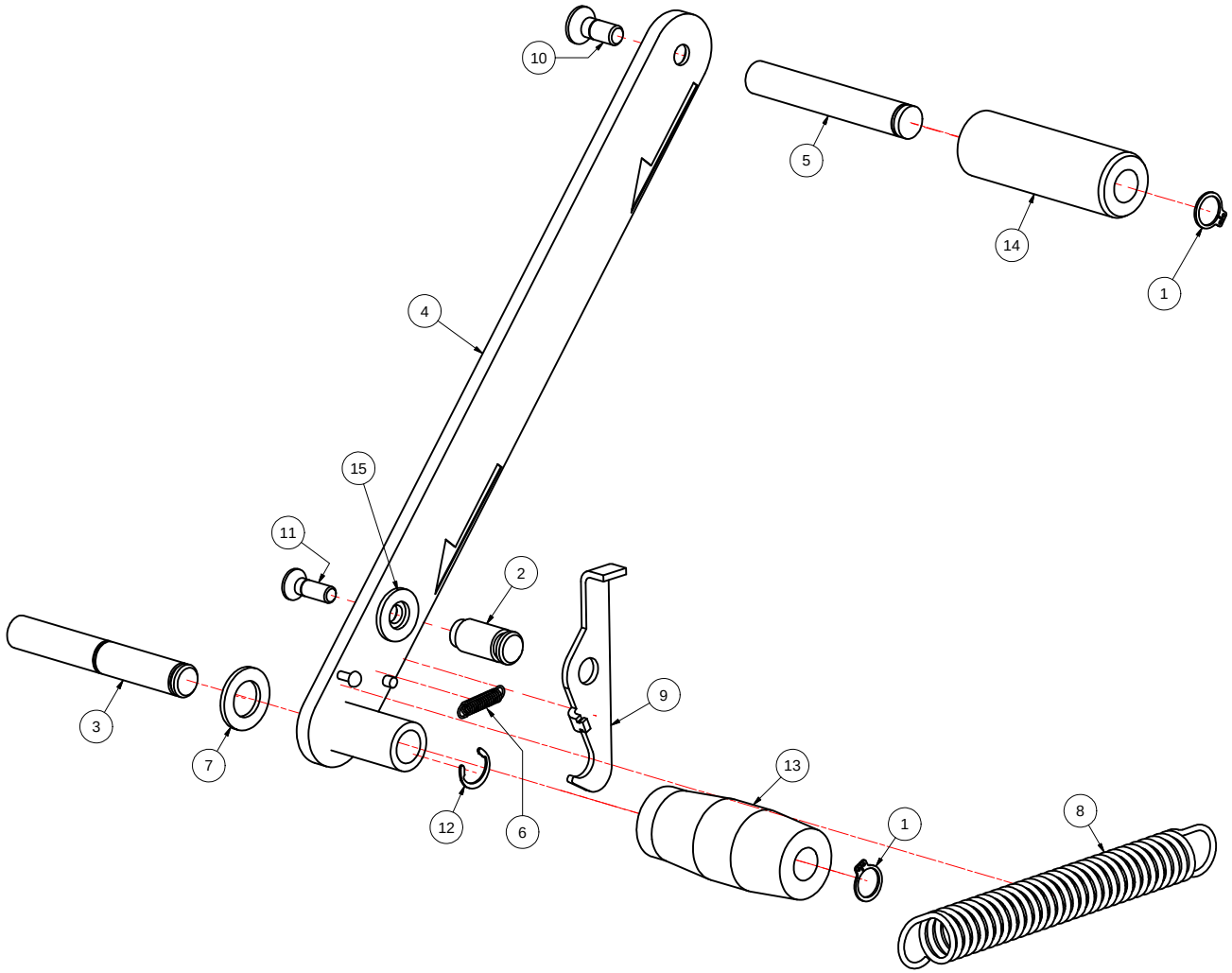
MAT'L	PART #	CAD FILE .TRA60A - .TRA61A	TOLERANCES UNLESS OTHERWISE NOTED:
C.R.S.	STD	PLOT DATE 1/19/2009	
ST. ST.		DRAWN DATE 1/19/2009	INCH .X =±.050 .XX =±.015 .XXX =±.005 ANGLES ±1/2°
STAINLESS : NO FINISH		DO NOT SCALE PRINT	METRIC .X =±1.0mm .XX =±.3mm .XXX =±.1mm MACH. FINISH 125
			FRACTIONS ± 1/64

LOVESHAW an ITW Company
RT. 296, SOUTH CANAAN, PA.

TITLE
TENSION ROLLER ASSEMBLY CAC60/61

DWG NO	.TRA60A/.TRA61A	SCALE	
MATERIAL		CHECKED	
DRAWN	AMYR	APPROVED	

REVISION HISTORY			
REV	DESCRIPTION	DATE	BY
C	UPDATED	4/19/2010	BJF



PARTS FOR .CAC60 2" CARTRIDGE

Parts List			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	2	SPH-1268	RETAINING RING 10mm
2	1	CAC60-0033-3	SPRING STUD
3	1	CAC60-0056-3	TAPE TENSION ARM SHAFT STEPPED
4	1	CAC60-0049-4	TAPE TENSION ARM
5	1	CAC60-0054-3	TAPE TENSION ARM SHAFT
6	1	SPR-1047	CATCH SPRING
7	1	SPH-1341	BRONZE WASHER, 3/8
8	1	SPR-1048	EXTENSION SPRING
9	1	CAC60-0055-3	CATCH
10	1	FFHMG016P10	FL. HD. CAP SCREW M6 X 1.0 X 16 LG.
11	1	FFHMF016P10	FL. HD. CAP SCREW M5 X 16 LG.
12	1	SPH-1369	CIRCLIP 10mm
13	1	CAC60-0079-4	TAPERED ROLLER
14	1	CAC60-0052-4	TAPE TENSION ARM ROLLER
15	1	FFWMHP	FLAT WASHER M8

PARTS FOR .CAC61 3" CARTRIDGE

Parts List			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	2	SPH-1268	RETAINING RING 10mm
2	1	CAC60-0033-3	SPRING STUD
3	1	CAC60-0056/3-3	TAPE TENSION ARM SHAFT STEPPED
4	1	CAC60-0049-4	TAPE TENSION ARM
5	1	CAC60-0054/3-3	TAPE TENSION ARM SHAFT
6	1	SPR-1047	CATCH SPRING
7	1	SPH-1341	BRONZE WASHER, 3/8
8	1	SPR-1048	EXTENSION SPRING
9	1	CAC60-0055-3	CATCH
10	1	FFHMG016P10	FL. HD. CAP SCREW M6 X 1.0 X 16 LG.
11	1	FFHMF016P10	FL. HD. CAP SCREW M5 X 16 LG.
12	1	SPH-1369	CIRCLIP 10mm
13	1	CAC60-0079/3-4	TAPERED ROLLER
14	1	CAC60-0052/3-4	TAPE TENSION ARM ROLLER
15	1	FFWMHP	FLAT WASHER M8

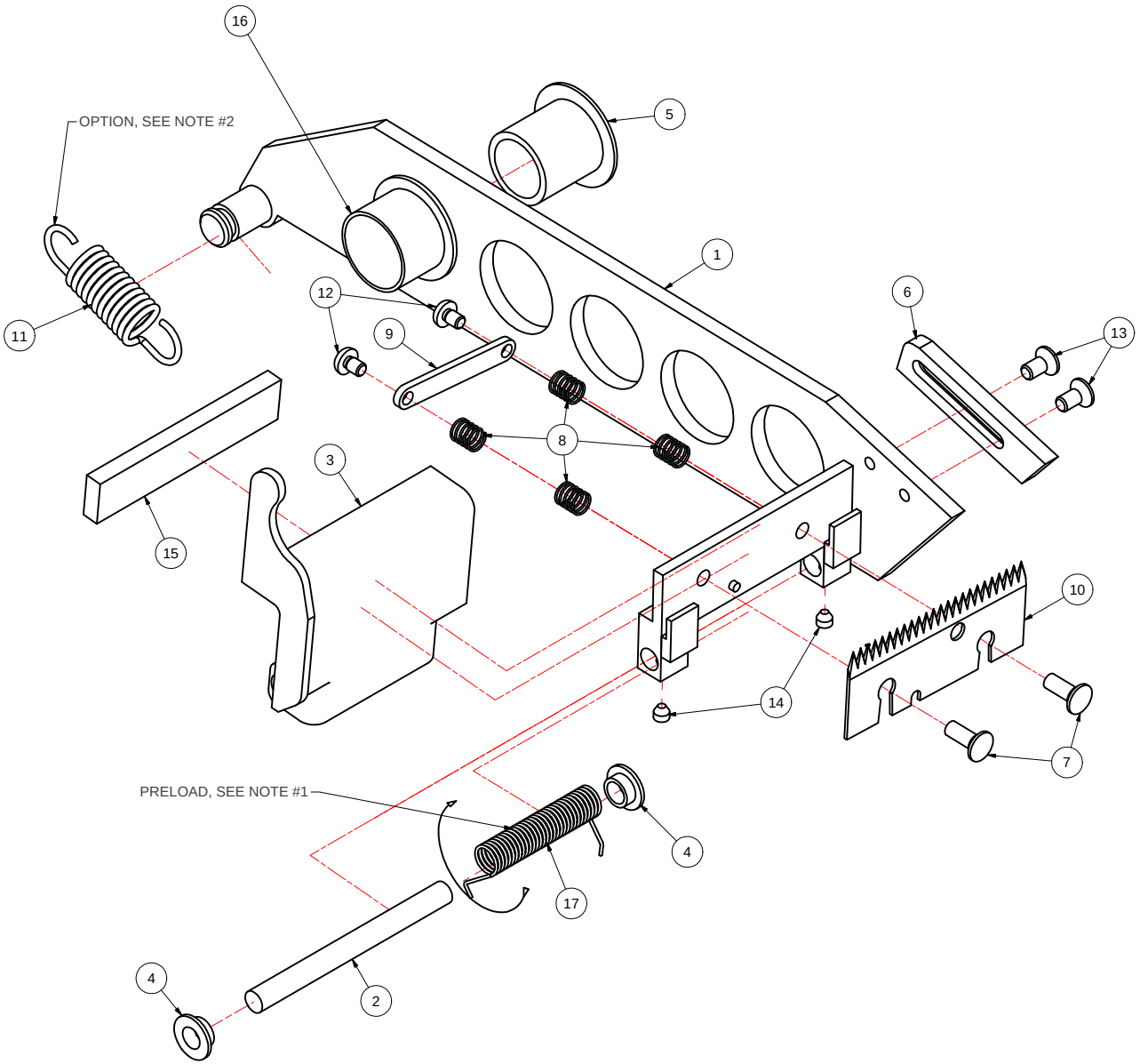
MAT'L	PART #	CAD FILE .TAACAC60	TOLERANCES UNLESS OTHERWISE NOTED:
C.R.S.	STD	PLOT DATE 4/20/2010	
ST. ST.		DRAWN DATE 6/26/2008	INCH .X =±.050 .XX =±.015 .XXX =±.005 ANGLES ±1/2°
STAINLESS : NO FINISH		DO NOT SCALE PRINT	METRIC .X =±1.0mm .XX =±.3mm .XXX =±.1mm MACH. FINISH 125
			FRACTIONS ± 1/64

LOVESHAW an ITW Company
RT. 296, SOUTH CANAAN, PA.

TITLE
TAPE TENSION ARM ASSEMBLY

DWG NO	.TAACAC60/61	SCALE	
MATERIAL		CHECKED	
DRAWN	AMYR	APPROVED	

REVISION HISTORY			
REV	DESCRIPTION	DATE	BY
B	UPDATED	4/19/2010	BJF



PARTS FOR .CAC60 2" CARTRIDGE

Parts List			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	CAC60-0022-6	KNIFE ARM
2	1	CAC60-0028-3	KNIFE GUARD PIVOT PIN
3	1	CAC60-0029-5	KNIFE GUARD
4	2	BSG-1091	BUSHING, 6mm
5	1	CAC60-0030-3	BUSHING
6	1	CAC60-0036-3	TAB ADJUSTER
7	2	CAC60-0042-3	PIN
8	4	SPR-1045	SPRING
9	1	CAC60-0043-3	PIN PLATE
10	1	PSC11B60-4	KNIFE BLADE 2"
11	1	SPR-1042	EXTENSION SPRING
12	2	FBHMD005P10	BUTT. HD. M3 X 5
13	2	FFHME008P10	FL. HD. CAP SCREW M4 X 8
14	2	FSSME004P10	CUP POINT SET SCREW M4 X 4
15	1	CAC60-0078-3	KNIFE GUARD CUSHION
16	1	CAC60-0081-3	BRONZE BUSHING
17	1	SPR-1063	TORSION SPRING

PARTS FOR .CAC61 3" CARTRIDGE

Parts List			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	CAC60-0022/3-6	KNIFE ARM
2	1	CAC60-0028/3-3	KNIFE GUARD PIVOT PIN
3	1	CAC60-0029/3-5	KNIFE GUARD
4	2	BSG-1091	BUSHING, 6mm
5	1	CAC60-0030-3	BUSHING
6	1	CAC60-0036-3	TAB ADJUSTER
7	2	CAC60-0042-3	PIN
8	2	SPR-1045	SPRING
9	1	CAC60-0043/3-3	PIN PLATE
10	1	PS4117A60-4	KNIFE BLADE 3"
11	1	SPR-1042	EXTENSION SPRING
12	2	FBHMD005P10	BUTT. HD. M3 X 5
13	2	FFHME008P10	FL. HD. CAP SCREW M4 X 8
14	2	FSSME004P10	CUP POINT SET SCREW M4 X 4
15	1	CAC60-0078/3-3	KNIFE GUARD CUSHION
16	1	CAC60-0081-3	BRONZE BUSHING
17	1	SPR-1063	TORSION SPRING

SPECIAL NOTES:

1) ITEM #17, TORSION SPRING, MUST BE PRELOADED ONE FULL TURN TO GET THE APPROPIATE TENSION. IT MUST BE WOUND IN THE DIRECITION IT'S WRAPPED IN TO FUNCTION CORRECTLY.

2) OPTIONAL SPRING FOR PROCESSING VOID BOXES: LOVESHAW # SPR-1042LD. (LIGHT DUTY SPRING IS RED IN COLOR FOR EASY VISUAL IDENTIFICATION).

MAT'L	PART #	CAD FILE	KAACAC60
C.R.S.	STD	PLOT DATE	4/19/2010
ST. ST.		DRAWN DATE	6/24/2008
STAINLESS : NO FINISH		DO NOT SCALE PRINT	

TOLERANCES UNLESS OTHERWISE NOTED:

INCH .X = ±.050, .XX = ±.015, .XXX = ±.005, ANGLES ± 1/2°

METRIC .X = ±1.0mm, .XX = ±.3mm, .XXX = ±.1mm, MACH. FINISH 125

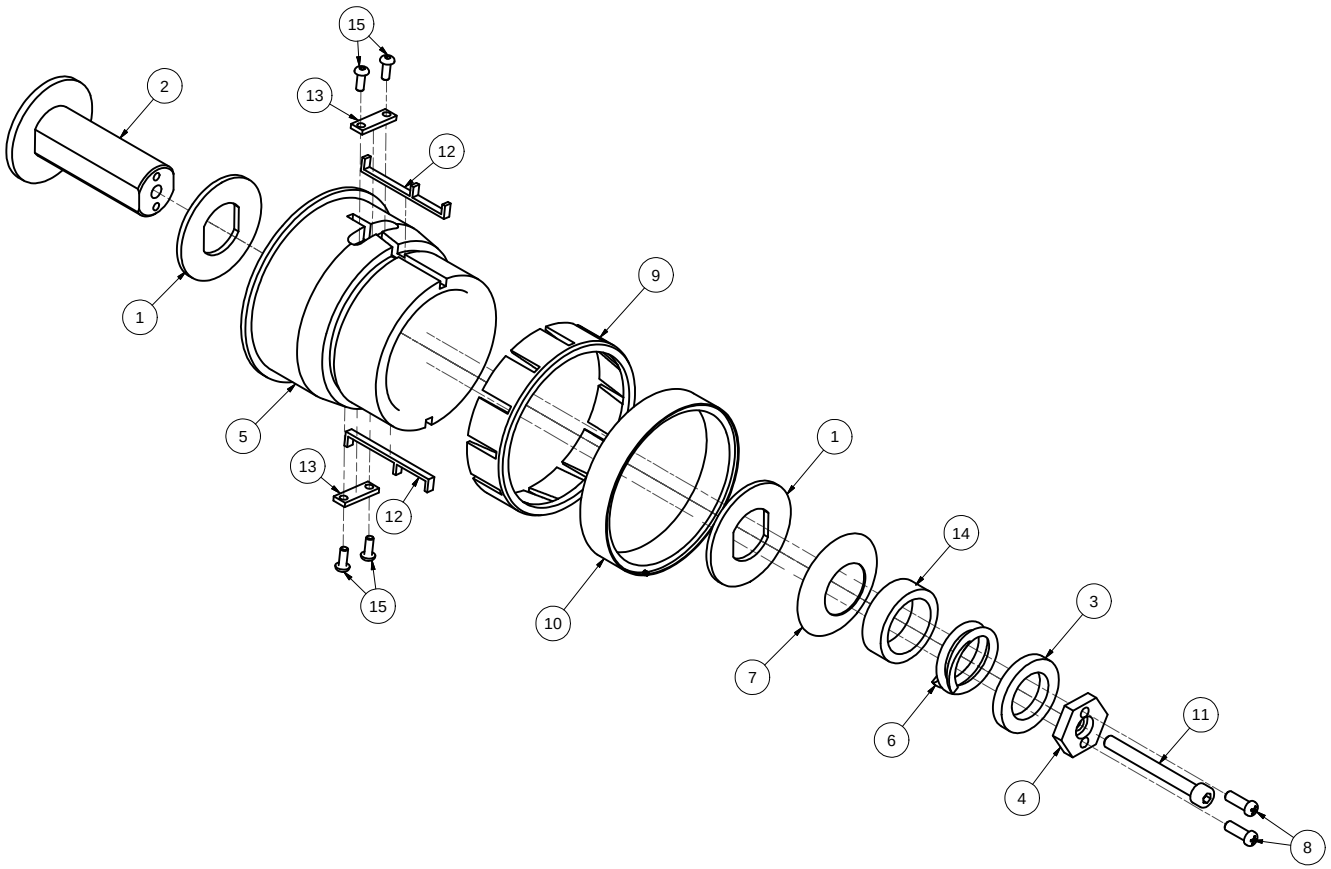
FRACTIONS ± 1/64

LOVESHAW an *ITW* Company
RT. 296, SOUTH CANAAN, PA.

TITLE: KNIFE ASSEMBLY .CAC60/61

DWG NO	.KAACAC60/61	SCALE	
MATERIAL		CHECKED	
DRAWN	AMYR	APPROVED	

REVISION HISTORY			
REV	DESCRIPTION	DATE	BY
A	RELEASED	6/25/2008	AMYR



PARTS FOR .CAC60 2" CARTRIDGE

Parts List			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	2	PSC28-3	BRAKE WASHER
2	1	CAC50-096A-4	SHAFT, TAPE CORE THREADED
3	1	PSC142-3	TAPE CORE NUT
4	1	CAC50-095-3	HEX LOCK NUT
5	1	CAC60-0044-5	TAPE CORE 2"
6	1	PSC33B-3	SPRING COMPRESSION
7	1	PSC33	SPRING DISC
8	2	SPH-1221	PAN HD. SCREW M4 X 12
9	1	CAC60-0045-4	COLLAR, TAPE CORE
10	1	CAC60-0046-3	TAPE CORE NUT
11	1	FSHMF050B10	SOC. HD. CAP SCREW M5 X 50
12	2	CAC60-0050-3	RETAINING CLIP W/ LOCK
13	2	CAC60-0057-3	KEY STOP
14	1	CAC60-0061-3	SPRING SLEEVE
15	4	FBHMD008P10	BUTT. HD. M3 X 8

PARTS FOR .CAC61 3" CARTRIDGE

Parts List			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	2	PSC28-3	BRAKE WASHER
2	1	CAC50-096A-4	SHAFT, TAPE CORE THREADED
3	1	LP06B-039-3	TAPE CORE NUT
4	1	CAC50-101-3	HEX LOCK NUT
5	1	CAC60-0044/3-5	TAPE CORE 3"
6	1	PSC33B-3	SPRING COMPRESSION
7	1	PSC33	SPRING DISC
8	2	SPH-1220	PAN HD. SCREW M4 X 40
9	1	CAC60-0045-4	COLLAR, TAPE CORE
10	1	CAC60-0046-3	TAPE CORE NUT
11	1	FSHMF050B10	SOC. HD. CAP SCREW M5 X 50
12	2	CAC60-0050-3	RETAINING CLIP W/ LOCK
13	2	CAC60-0057-3	KEY STOP
14	1	CAC60-0061-3	SPRING SLEEVE
15	4	FBHMD008P10	BUTT. HD. M3 X 8

MAT'L	PART #	CAD FILE .TCA2-AMY	TOLERANCES UNLESS OTHERWISE NOTED:
C.R.S.	STD	PLOT DATE 11/13/2008	
ST. ST.		DRAWN DATE 6/25/2008	INCH .X =±.050 .XX =±.015 .XXX =±.005 ANGLES ±1/2°
STAINLESS : NO FINISH		DO NOT SCALE PRINT	METRIC .X =±1.0mm .XX =±.3mm .XXX =±.1mm MACH. FINISH 125
			FRACTIONS ± 1/64

LOVESHAW an ITW Company
RT. 296, SOUTH CANAAN, PA.

TITLE
TAPE CORE ASSEMBLY

DWG NO .TCA2/3	SCALE
MATERIAL	CHECKED
DRAWN AMYR	APPROVED

CAC60 2-INCH

RECOMMENDED SPARE PARTS KIT FOR CAC60 SIDE THREAD CARTRIDGE

KIT PART # .REPKIT-CAC60

PART #	QTY	DESCRIPTION
CAC60-0002-4	2	ROLLER
PSC11B60-4	2	KNIFE BLADE 2"
SPR-1055	1	SPRING EXTRUSION
SPR-1044	1	COMPRESSION SPRING
SPR-1047	1	EXTENSION SPRING
X106R-PS/R	2	SPRING, TORSION REWORKED
PSC20-4	1	MAIN SPRING CARTRIDGE
.TRA60	1	TENSION ROLLER ASSEMBLY
PSC28-3	2	BRAKE WASHER
CAC60-0069-3	2	STOP, KNIFE ARM
BSG-1090	4	PLASTIC FLANGE BUSHING
CAC60-0009-3	1	BUSHING
BSG-1098	2	BUSHING
SPH-1276	4	SNAP RING, EXTERNAL
SPH-1268	2	RETAINING RING, EXTERNAL
SPR-1042	1	EXTENSION SPRING
SPH-1371	1	BUMPER
CAC60-0017-3	2	SHAFT CAP
CAC60-0078-3	1	KNIFE GUARD CUSHION
SPR-1045	2	COMPRESSION SPRING
CAC60-0042-3	2	PIN
CAC60-0043-3	1	PIN PLATE
BSG-1091	2	FLANGE BUSHING
SPR-1056	1	EXTENSION SPRING

CAC61 3-INCH

RECOMMENDED SPARE PARTS KIT FOR CAC61 SIDE THREAD CARTRIDGE

KIT PART # .REPKIT-CAC61

PART #	QTY	DESCRIPTION
CAC60-0002/3-4	2	ROLLER
PS4C117A60-4	2	KNIFE BLADE 2"
SPR-1055	1	SPRING EXTRUSION
SPR-1044	1	COMPRESSION SPRING
SPR-1047	1	EXTENSION SPRING
X106R-PS/R	2	SPRING, TORSION REWORKED
PSC20-4	1	MAIN SPRING CARTRIDGE
.TRA61	1	TENSION ROLLER ASSEMBLY
PSC28-3	2	BRAKE WASHER
CAC60-0069-3	2	STOP, KNIFE ARM
BSG-1090	4	PLASTIC FLANGE BUSHING
CAC60-0009-3	1	BUSHING
BSG-1098	2	BUSHING
SPH-1276	4	SNAP RING, EXTERNAL
SPH-1268	2	RETAINING RING, EXTERNAL
SPR-1042	1	EXTENSION SPRING
SPH-1371	1	BUMPER
CAC60-0017-3	2	SHAFT CAP
CAC60-0078/3-3	1	KNIFE GUARD CUSHION
SPR-1045	2	COMPRESSION SPRING
CAC60-0042-3	2	PIN
CAC60-0043/3-3	1	PIN PLATE
BSG-1091	2	FLANGE BUSHING
SPR-1056	1	EXTENSION SPRING